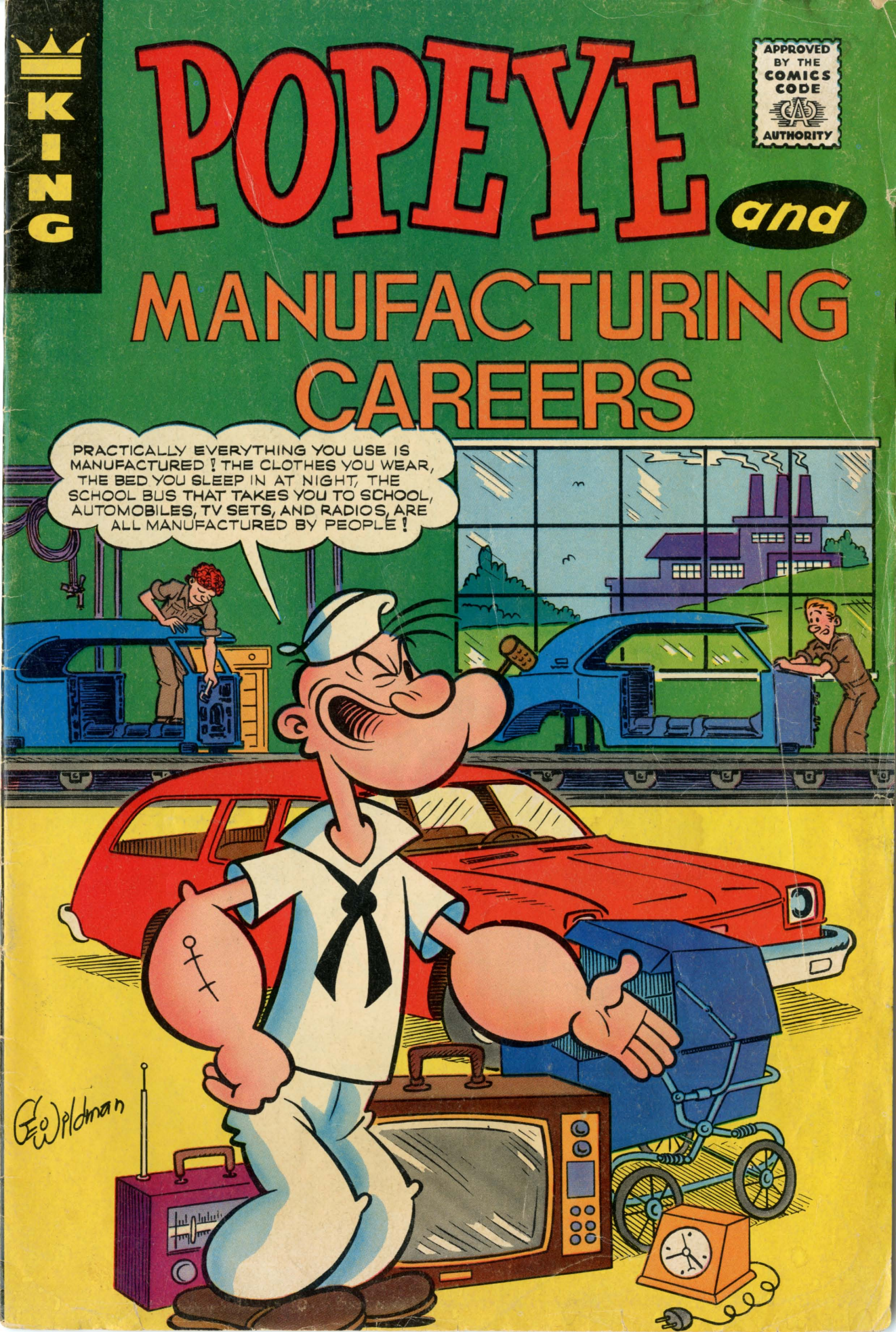
KING

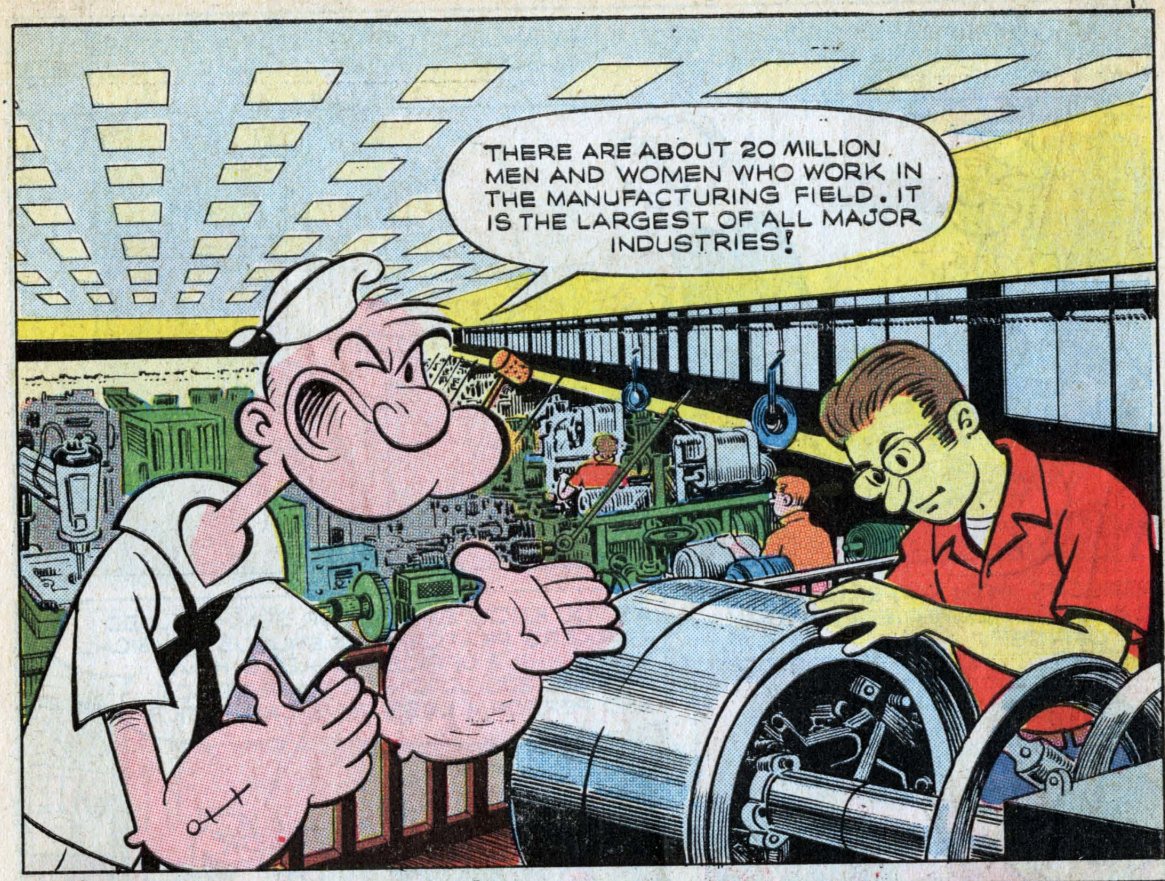
POPEYE and MANUFACTURING CAREERS

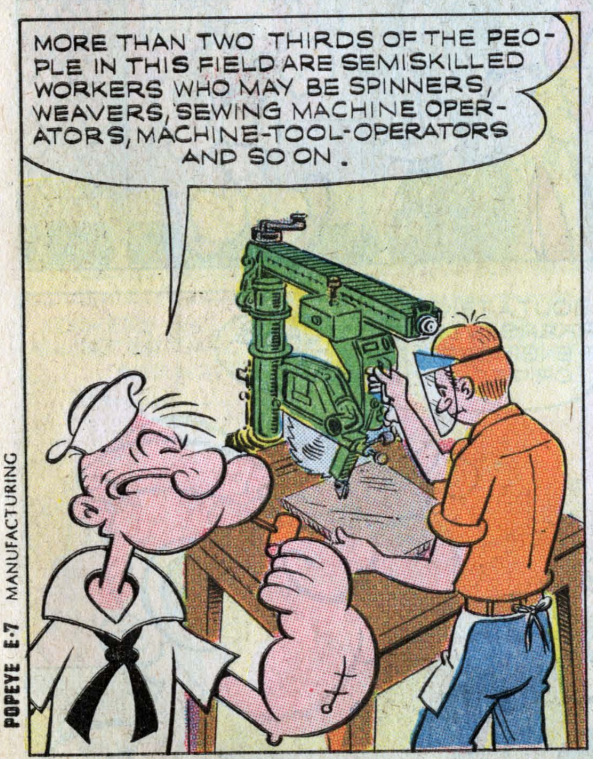
APPROVED BY THE COMICS CODE AUTHORITY

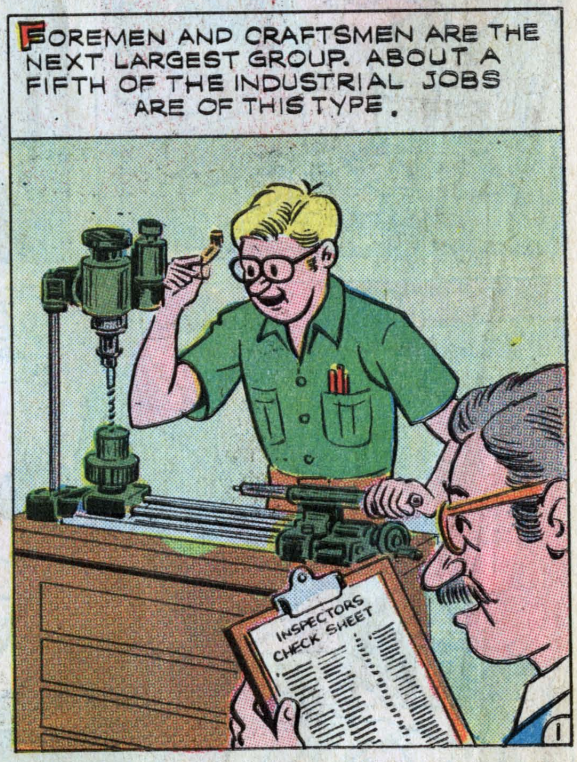

PRACTICALLY EVERYTHING YOU USE IS MANUFACTURED ! THE CLOTHES YOU WEAR, THE BED YOU SLEEP IN AT NIGHT, THE SCHOOL BUS THAT TAKES YOU TO SCHOOL, AUTOMOBILES, TV SETS, AND RADIOS, ARE ALL MANUFACTURED BY PEOPLE !
E. Wellman

WRITER: JOE GILL

ARTIST: PAUL FUNG




MORE THAN TWO THIRDS OF THE PEOPLE IN THIS FIELD ARE SEMISKILLED WORKERS WHO MAY BE SPINNERS, WEAVERS, SEWING MACHINE OPERATORS, MACHINE-TOOL-OPERATORS AND SO ON.


FOREMEN AND CRAFTSMEN ARE THE NEXT LARGEST GROUP. ABOUT A FIFTH OF THE INDUSTRIAL JOBS ARE OF THIS TYPE.
INSPECTORS CHECK SHEET

POPEYE E-7 MANUFACTURING

POPEYE E-7
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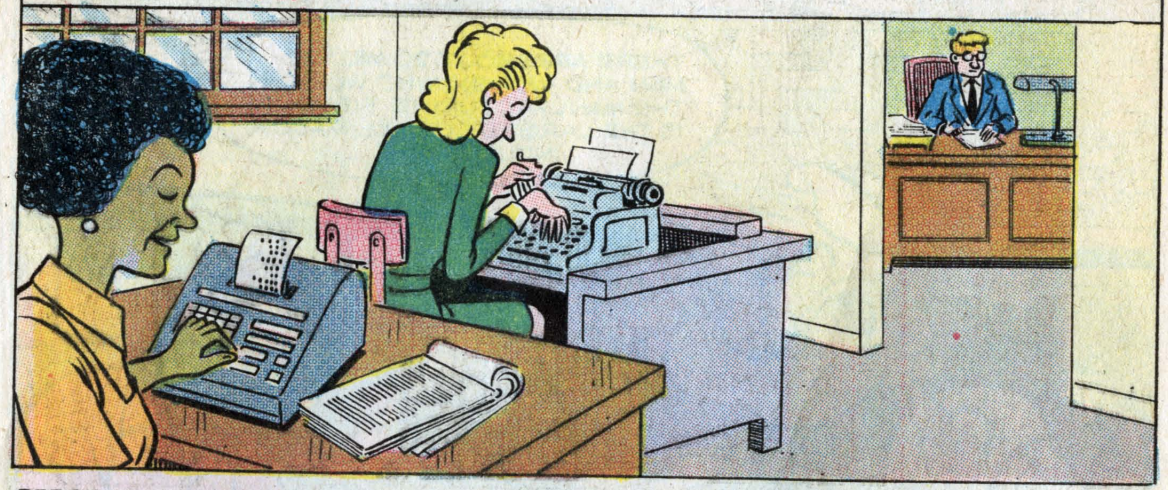
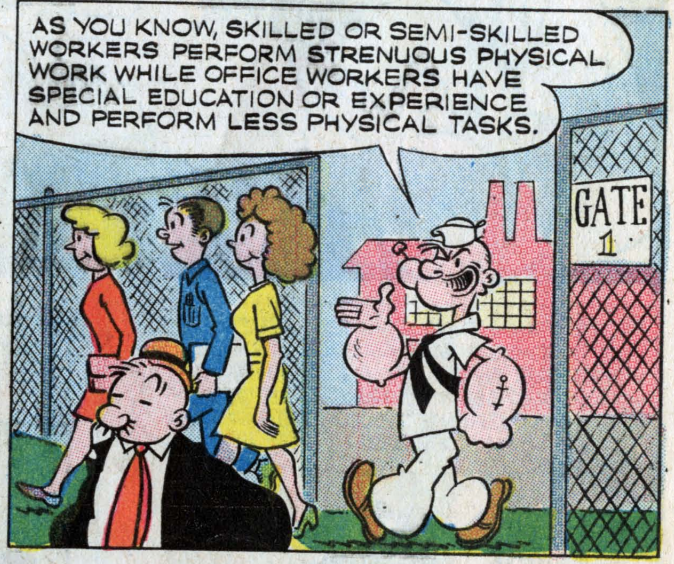
THE THIRD LARGEST GROUP OF PEOPLE IN MANUFACTURING WORK IN OFFICES. MANY WOMEN ARE EMPLOYED DOING THE BOOKKEEPING, MAKING OUT PAYROLLS AND TYPING REPORTS.

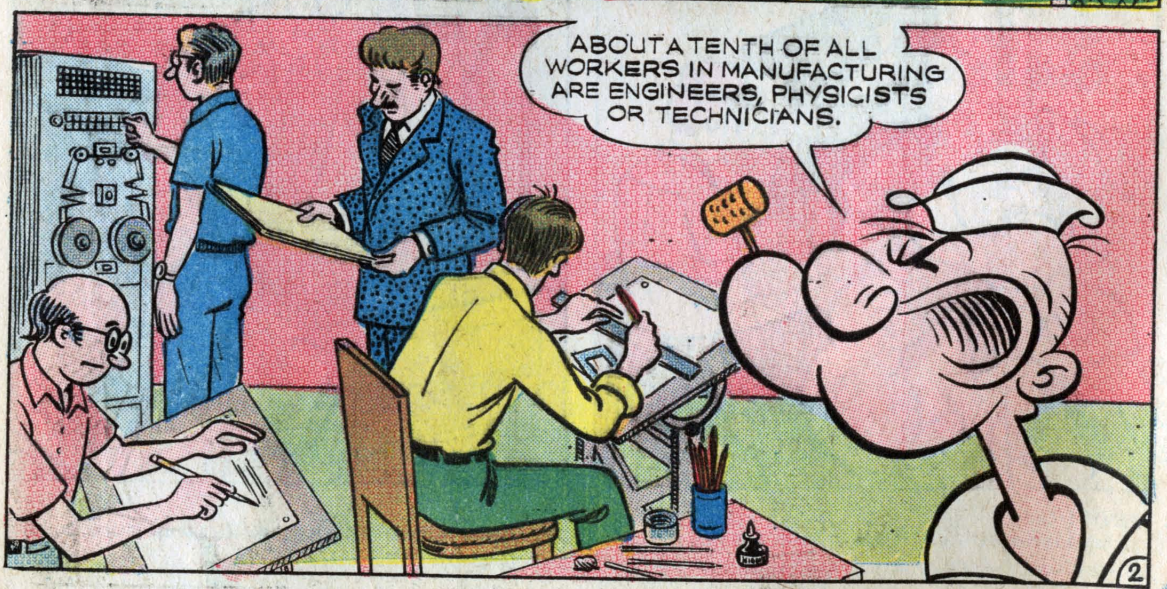


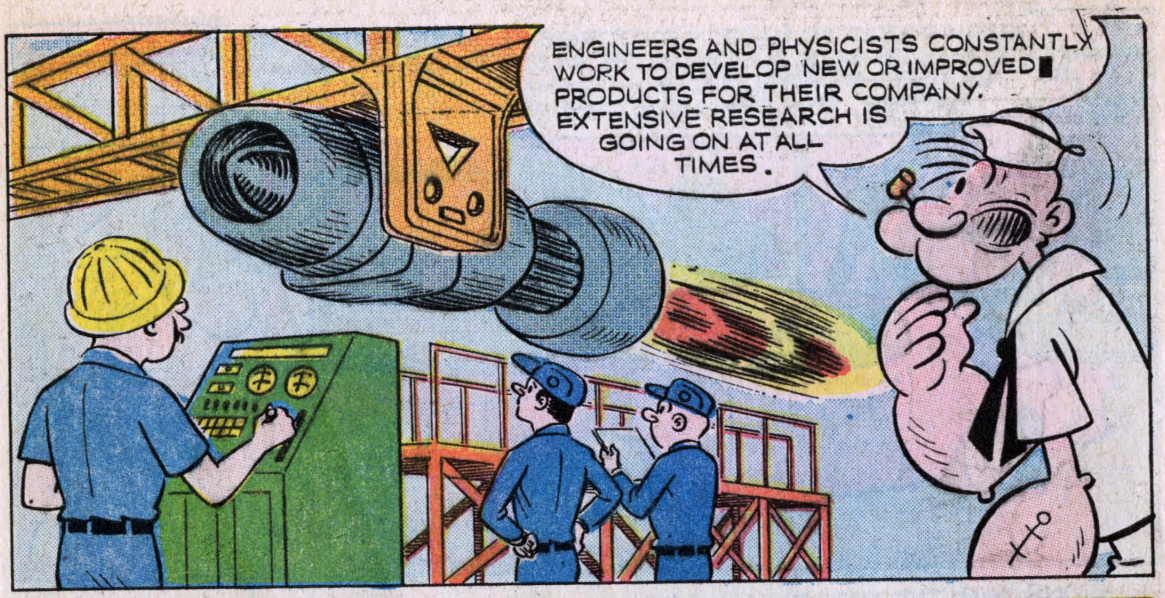
PERSONS WITH DIFFERENT EDUCATIONAL EXPERIENCE WORK IN OFFICES.

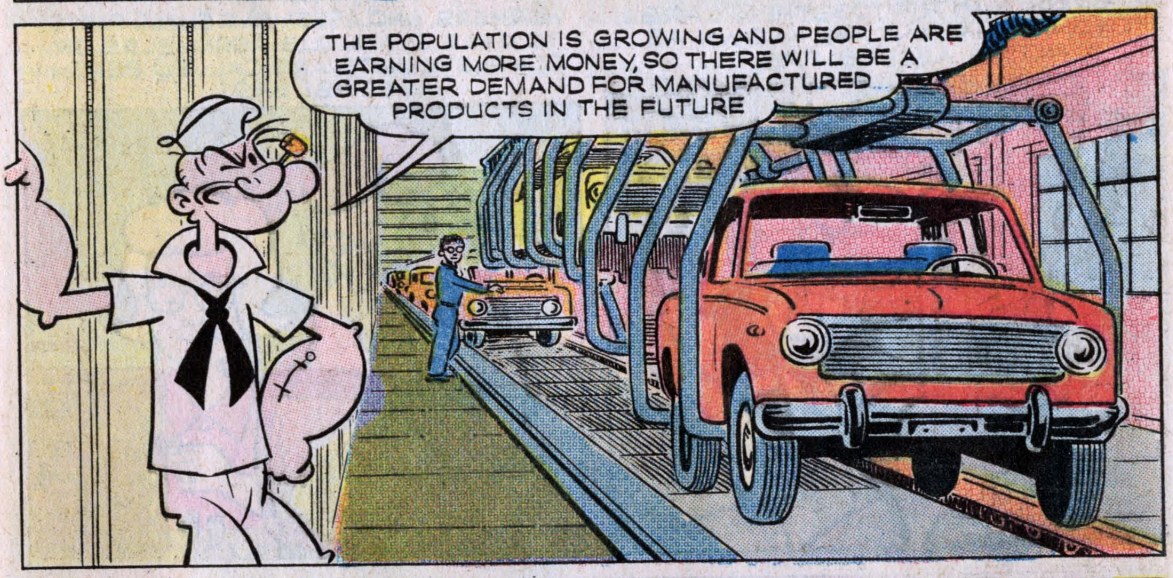
AS YOU KNOW, SKILLED OR SEMI-SKILLED WORKERS PERFORM STRENUOUS PHYSICAL WORK WHILE OFFICE WORKERS HAVE SPECIAL EDUCATION OR EXPERIENCE AND PERFORM LESS PHYSICAL TASKS.

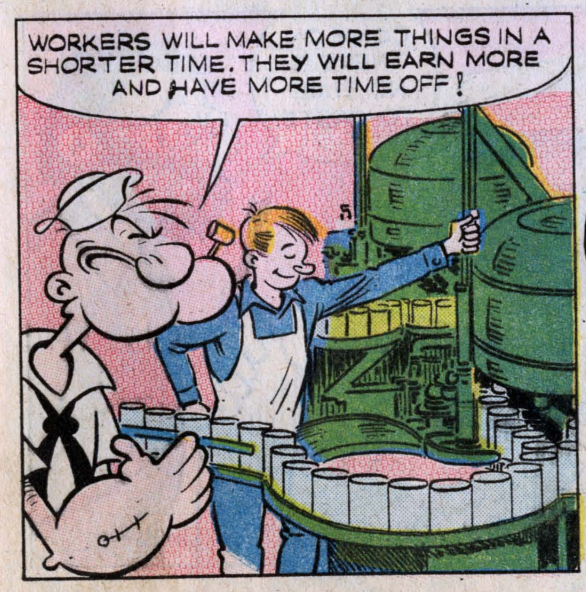


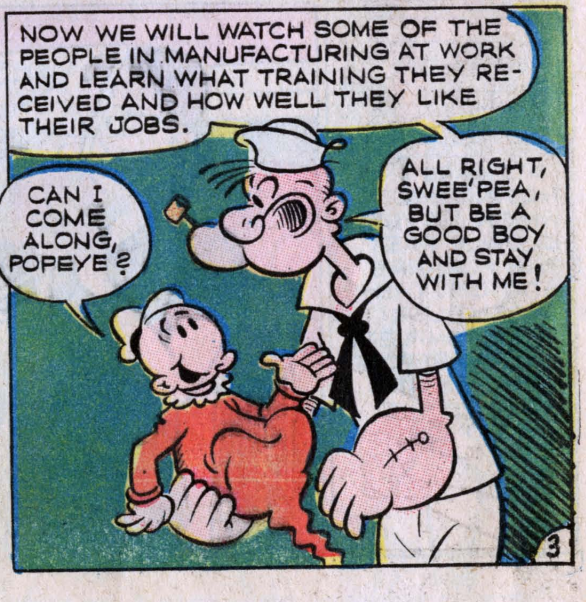
ABOUT A TENTH OF ALL WORKERS IN MANUFACTURING ARE ENGINEERS, PHYSICISTS OR TECHNICIANS.

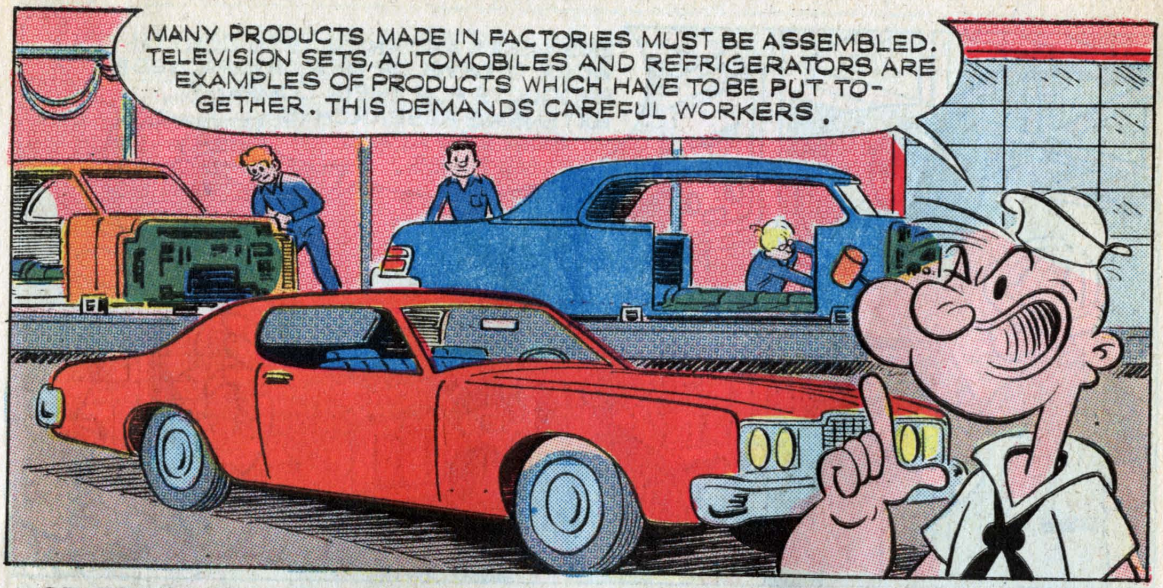



ENGINEERS AND PHYSICISTS CONSTANTLY WORK TO DEVELOP NEW OR IMPROVED PRODUCTS FOR THEIR COMPANY. EXTENSIVE RESEARCH IS GOING ON AT ALL TIMES.

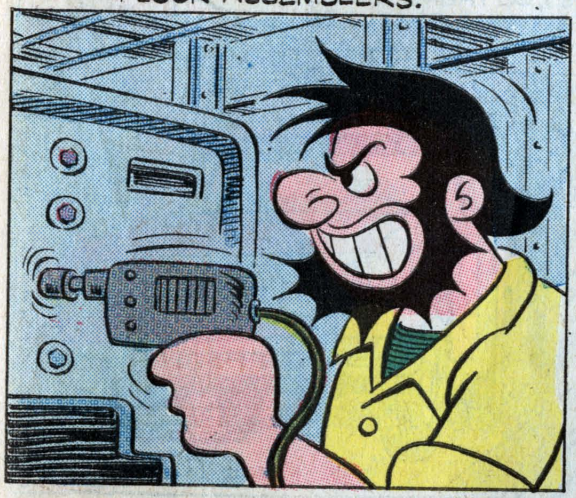

THE POPULATION IS GROWING AND PEOPLE ARE EARNING MORE MONEY, SO THERE WILL BE A GREATER DEMAND FOR MANUFACTURED PRODUCTS IN THE FUTURE


WORKERS WILL MAKE MORE THINGS IN A SHORTER TIME. THEY WILL EARN MORE AND HAVE MORE TIME OFF!

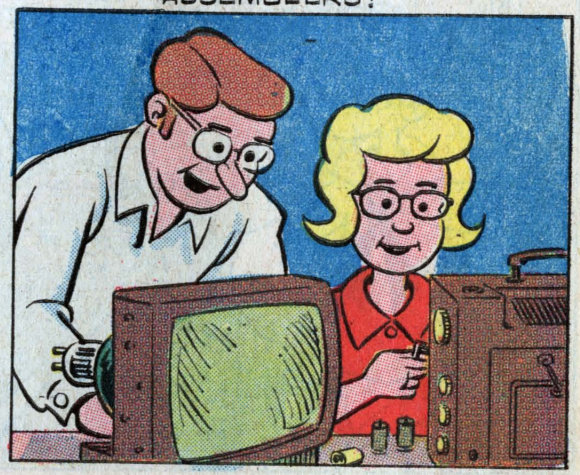

NOW WE WILL WATCH SOME OF THE PEOPLE IN MANUFACTURING AT WORK AND LEARN WHAT TRAINING THEY RECEIVED AND HOW WELL THEY LIKE THEIR JOBS.
CAN I COME ALONG, POPEYE?
ALL RIGHT, SWEE'PEA, BUT BE A GOOD BOY AND STAY WITH ME!


MANY PRODUCTS MADE IN FACTORIES MUST BE ASSEMBLED. TELEVISION SETS, AUTOMOBILES AND REFRIGERATORS ARE EXAMPLES OF PRODUCTS WHICH HAVE TO BE PUT TOGETHER. THIS DEMANDS CAREFUL WORKERS.

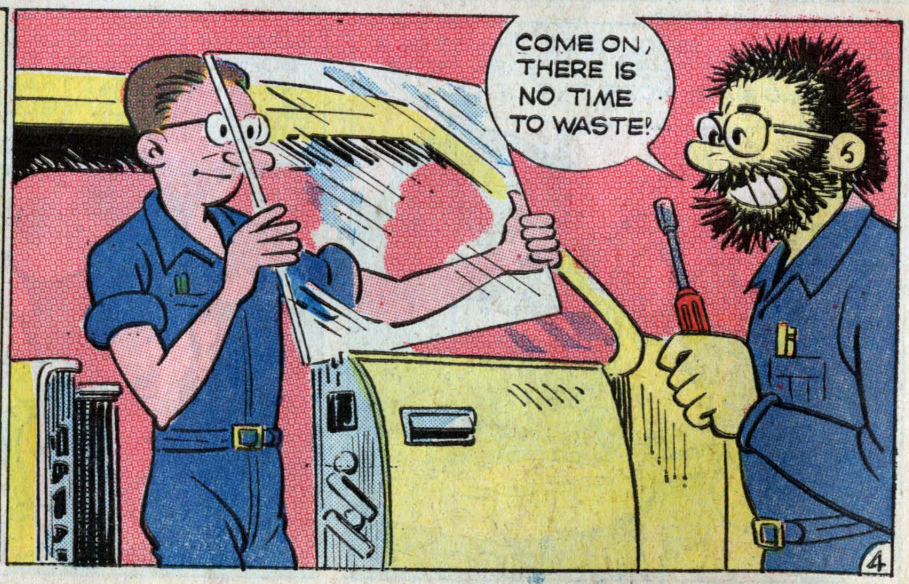
WORKERS WHO PUT TOGETHER LARGE, HEAVY EQUIPMENT ARE KNOWN AS FLOOR ASSEMBLERS.

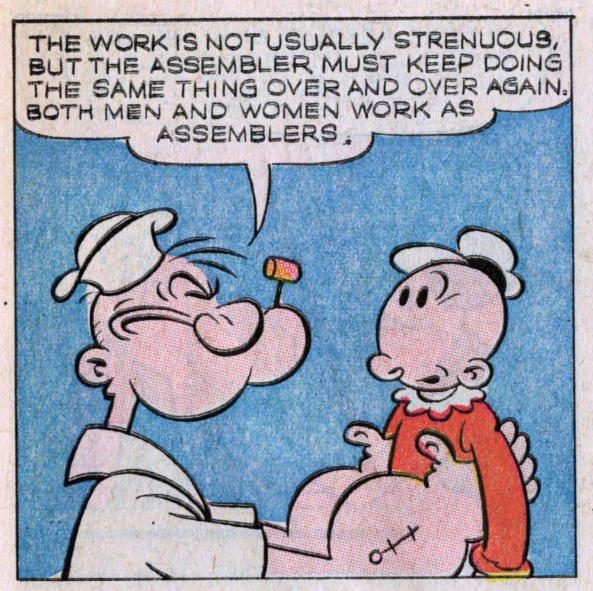


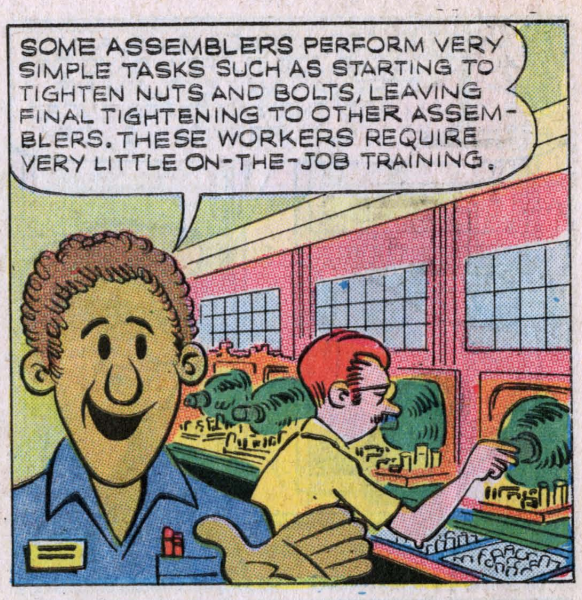
WORKERS WHO ASSEMBLE SMALL PARTS TO MAKE SMALL SUB-ASSEMBLES OR COMPLETE UNITS ARE CALLED BENCH ASSEMBLERS!

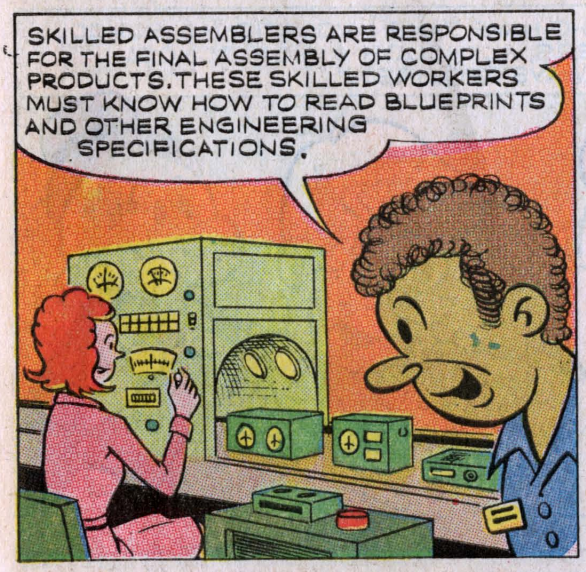


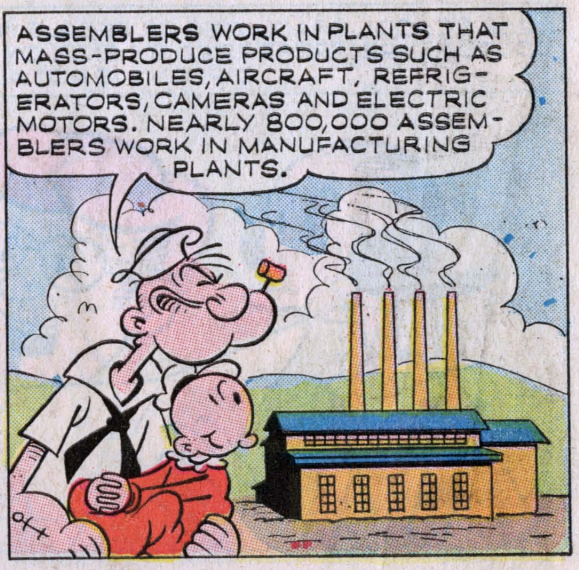
THE PRODUCTS OFTEN ARE ON A MOVING BELT WHICH MOVES SLOWLY PAST THE WORKER'S STATION. THE ASSEMBLER MUST COMPLETE HIS JOB BEFORE THE UNIT HAS PASSED HIS STATION.

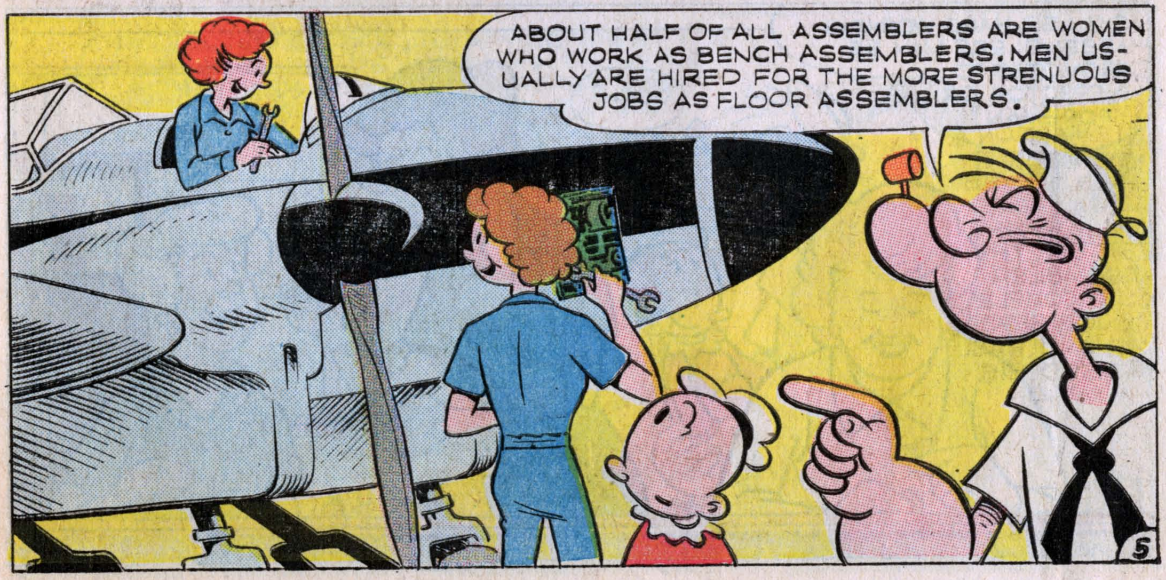



THE WORK IS NOT USUALLY STRENUOUS, BUT THE ASSEMBLER MUST KEEP DOING THE SAME THING OVER AND OVER AGAIN. BOTH MEN AND WOMEN WORK AS ASSEMBLERS.


SOME ASSEMBLERS PERFORM VERY SIMPLE TASKS SUCH AS STARTING TO TIGHTEN NUTS AND BOLTS, LEAVING FINAL TIGHTENING TO OTHER ASSEMBLERS. THESE WORKERS REQUIRE VERY LITTLE ON-THE-JOB TRAINING.


SKILLED ASSEMBLERS ARE RESPONSIBLE FOR THE FINAL ASSEMBLY OF COMPLEX PRODUCTS. THESE SKILLED WORKERS MUST KNOW HOW TO READ BLUEPRINTS AND OTHER ENGINEERING SPECIFICATIONS.


ASSEMBLERS WORK IN PLANTS THAT MASS-PRODUCE PRODUCTS SUCH AS AUTOMOBILES, AIRCRAFT, REFRIGERATORS, CAMERAS AND ELECTRIC MOTORS. NEARLY 800,000 ASSEMBLERS WORK IN MANUFACTURING PLANTS.


ABOUT HALF OF ALL ASSEMBLERS ARE WOMEN WHO WORK AS BENCH ASSEMBLERS. MEN USUALLY ARE HIRED FOR THE MORE STRENUOUS JOBS AS FLOOR ASSEMBLERS.
5

AN EXPERIENCED WORKER IS USUALLY TRAINED ON THE JOB IN A FEW DAYS OR WEEKS. A FOREMAN MAY EXPLAIN HIS JOB TO HIM AND THEN AN EXPERIENCED ASSEMBLER WILL SUPERVISE HIS WORK.
WE NEED ASSEMBLERS WHO ARE PHYSICALLY FIT, DEPENDABLE, AND HAVE SOME ABILITY TO DO MECHANICAL WORK.
HIGH SCHOOL GRADUATES OR PEOPLE WHO HAVE TAKEN VOCATIONAL SCHOOL COURSES ARE PREFERRED BY EMPLOYERS, ALTHOUGH A HIGH-SCHOOL DIPLOMA IS NOT ALWAYS REQUIRED.
BLUEPRINT OF SECTION A-B PARTS THREE & FOUR
SKILLED, HARD WORKING ASSEMBLERS MAY BE PROMOTED TO INSPECTOR OR FOREMAN!
GOSH!

ALMOST EVERYTHING THAT'S MANUFACTURED, MUST BE CAREFULLY INSPECTED. ALL THE AUTOMOBILES, SEWING MACHINES, OTHER THINGS, BEING MADE MUST BE TESTED AND EXAMINED FOR DEFECTS.

INSPECTOR

SOME INSPECTORS MAY ONLY HAVE TO EXAMINE THE FINISHED PRODUCTS FOR SCRATCHES OR BLEMISHES WHILE OTHERS ARE EXPECTED TO USE GAGES, MICROMETERS AND OTHER MEASURING DEVICES TO CHECK THE PRODUCT.

INSPECTOR

THERE ARE NEARLY 600,000 INSPECTORS EMPLOYED IN THE MANUFACTURING FIELD.

ELECTRONIC ENGINE Tester

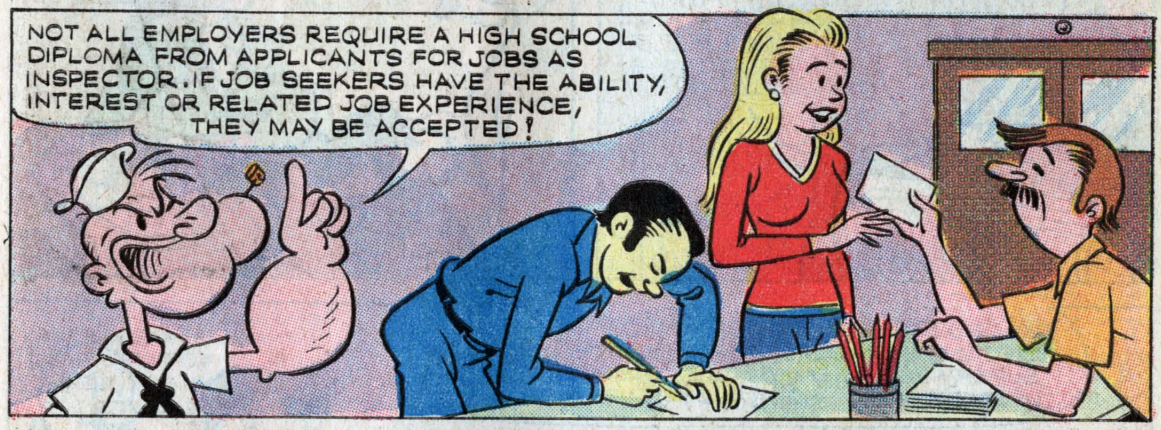
MANY INSPECTORS ARE WOMEN. THEY AND OTHERS INSPECT PRODUCTS IN THE FOOD, TEXTILE, APPAREL AND OTHER INDUSTRIES.

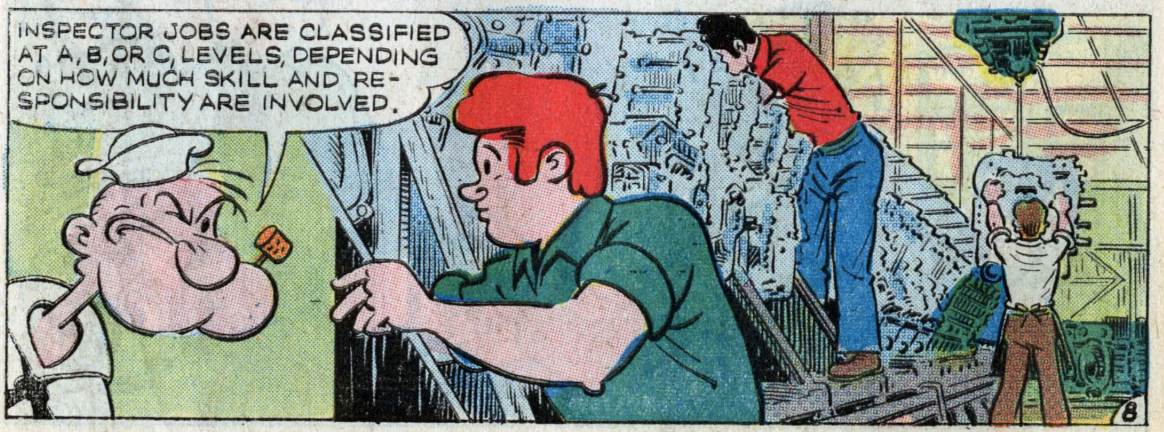
SKILLED INSPECTORS USE A WIDE VARIETY OF TEST INSTRUMENTS, WORKING WITH LITTLE SUPERVISION. SEMISKILLED INSPECTORS USUALLY WORK UNDER CLOSE SUPERVISION.

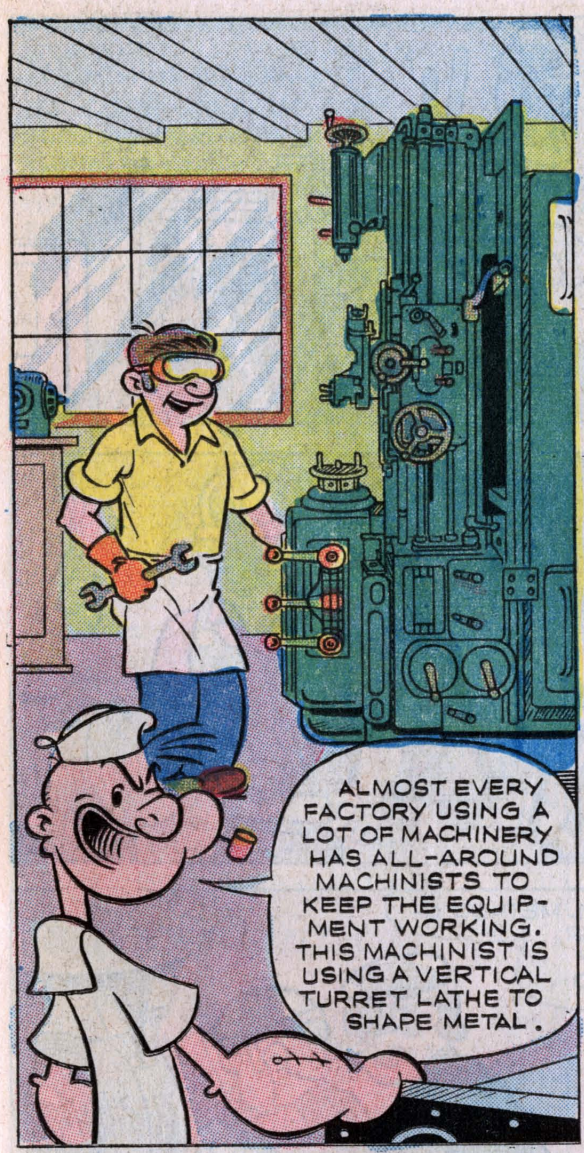
ELECTRONIC PART TESTER

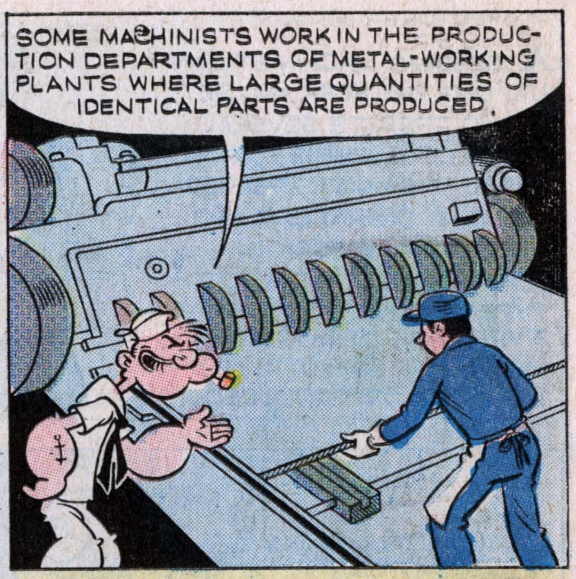
INSPECTORS LIKE THIS YOUNG GIRL IN A FOOD PROCESSING PLANT GET ON-THE-JOB TRAINING FOR A FEW HOURS OR A FEW WEEKS, DEPENDING ON THE SKILLS REQUIRED.

MOST EMPLOYERS LOOK FOR INSPECTORS WHO HAVE GOOD HEALTH AND EYESIGHT AND WHO CAN DO THE JOB WELL. SOME EMPLOYERS WOULD RATHER HAVE EXPERIENCED PRODUCTION WORKERS AS INSPECTORS.

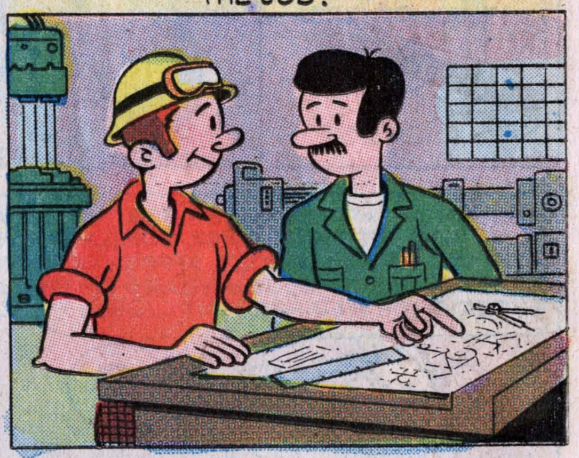

NOT ALL EMPLOYERS REQUIRE A HIGH SCHOOL DIPLOMA FROM APPLICANTS FOR JOBS AS INSPECTOR. IF JOB SEEKERS HAVE THE ABILITY, INTEREST OR RELATED JOB EXPERIENCE, THEY MAY BE ACCEPTED!



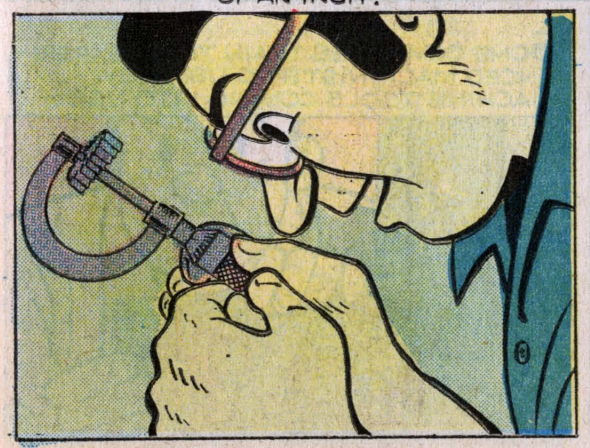

ALMOST EVERY FACTORY USING A LOT OF MACHINERY HAS ALL-AROUND MACHINISTS TO KEEP THE EQUIPMENT WORKING. THIS MACHINIST IS USING A VERTICAL TURRET LATHE TO SHAPE METAL.


SOME MACHINISTS WORK IN THE PRODUCTION DEPARTMENTS OF METAL-WORKING PLANTS WHERE LARGE QUANTITIES OF IDENTICAL PARTS ARE PRODUCED.

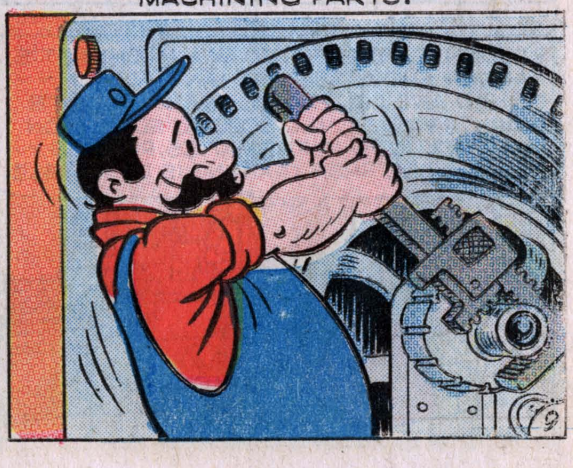
AN ALL-AROUND MACHINIST MUST READ BLUEPRINTS AND SELECT THE TOOLS AND METHODS REQUIRED TO COMPLETE THE JOB.



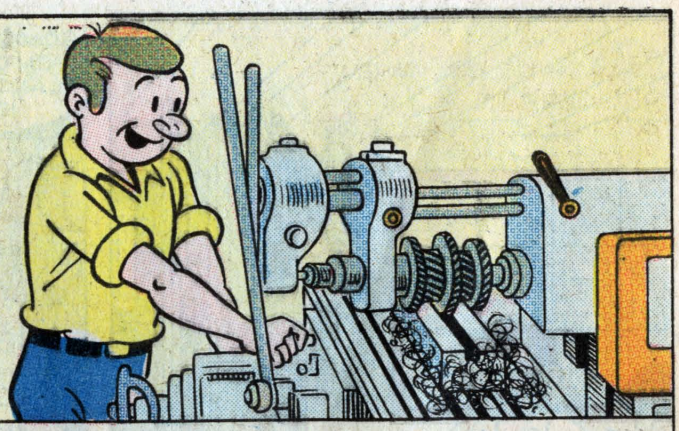
A SKILLED MACHINIST USES PRECISION-MEASURING TOOLS SUCH AS MICROMETERS AND GAUGES TO MEASURE THE ACCURACY OF HIS WORK TO WITHIN THOUSANDTHS OF AN INCH!



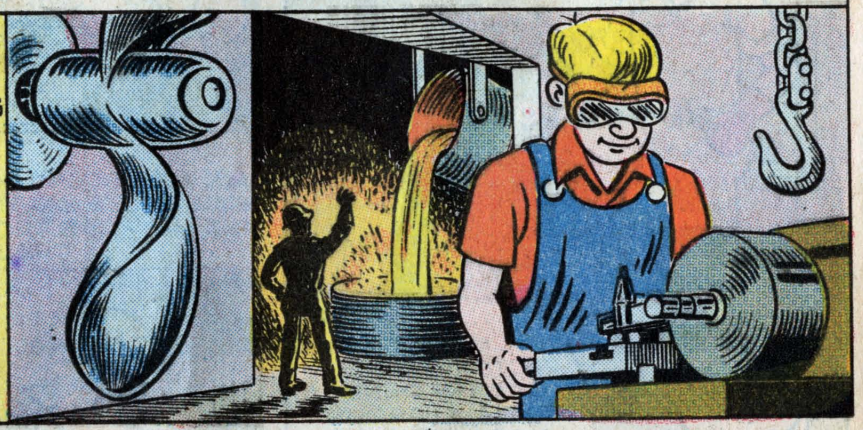
MOST MACHINISTS HAVE A WIDE KNOWLEDGE OF MECHANICAL PRINCIPLES. THEY FREQUENTLY REASSEMBLE MACHINERY AND MAKE ADJUSTMENTS AFTER MACHINING PARTS.



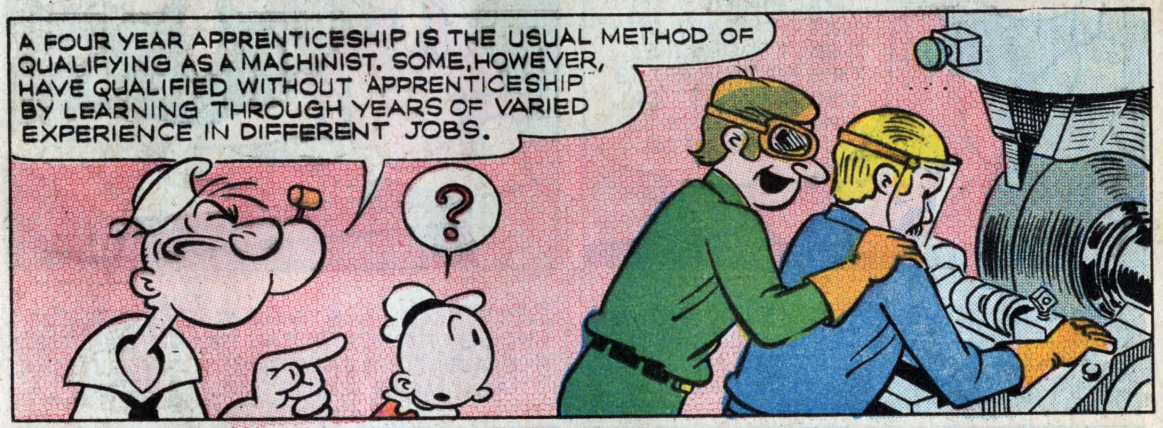
A GENERAL MACHINIST CAN LAY OUT THE WORK AND SET UP AND OPERATE SEVERAL KINDS OF MACHINE TOOLS. THESE MACHINISTS PERFORM DIFFICULT OPERATIONS AND THEY USUALLY WORK IN EXPERIMENTAL AND PROTOTYPE PRODUCTION. PROTOTYPES ARE THE FIRST MODELS OF WHAT IS TO BE MADE OR PRODUCED.



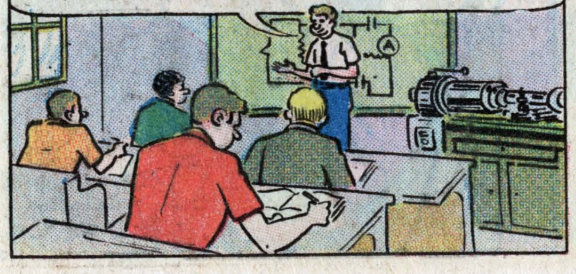
SOME METALWORKING ESTABLISHMENTS, SUCH AS ENGINE AND PROPELLER PLANTS, EMPLOY MORE GENERAL MACHINISTS THAN OTHERS.



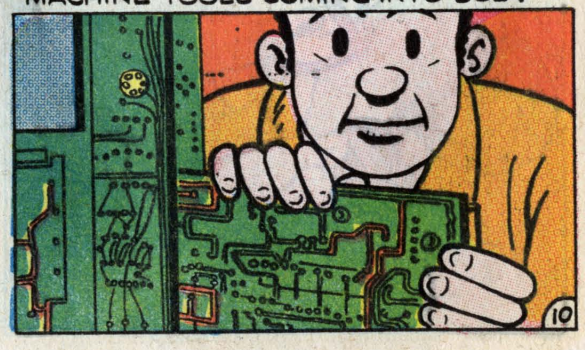
A FOUR YEAR APPRENTICESHIP IS THE USUAL METHOD OF QUALIFYING AS A MACHINIST. SOME, HOWEVER, HAVE QUALIFIED WITHOUT APPRENTICESHIP BY LEARNING THROUGH YEARS OF VARIED EXPERIENCE IN DIFFERENT JOBS.



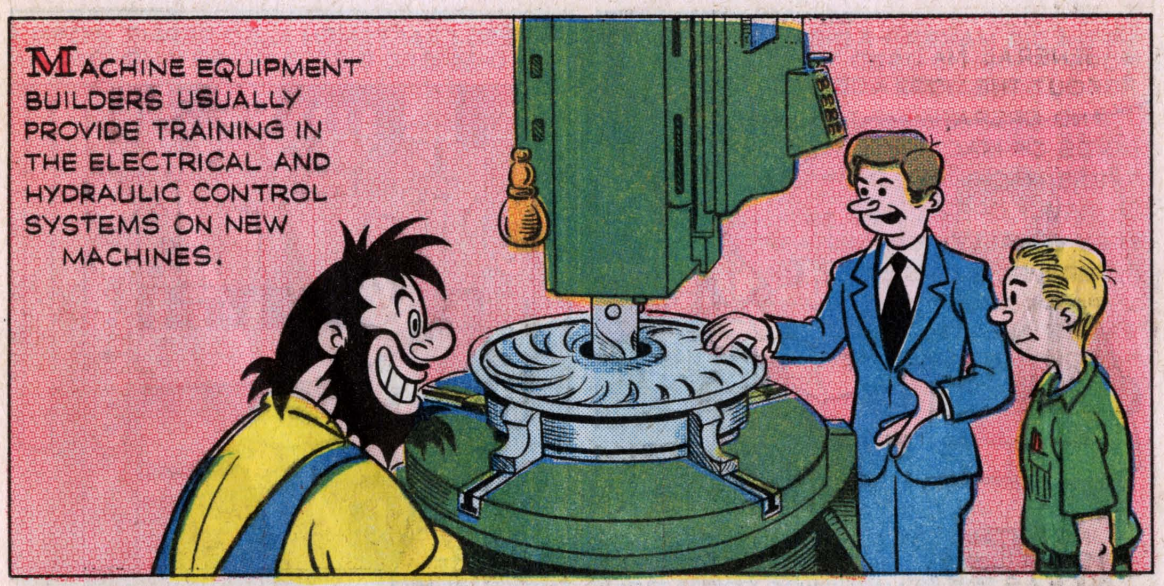
STUDENTS INTERESTED IN A MACHINIST'S CAREER SHOULD BE MECHANICALLY INCLINED AND ABLE TO DO VERY ACCURATE WORK. A VOCATIONAL SCHOOL EDUCATION THAT INCLUDES MATHEMATICS, PHYSICS AND MACHINE SHOP TRAINING IS DESIRABLE.



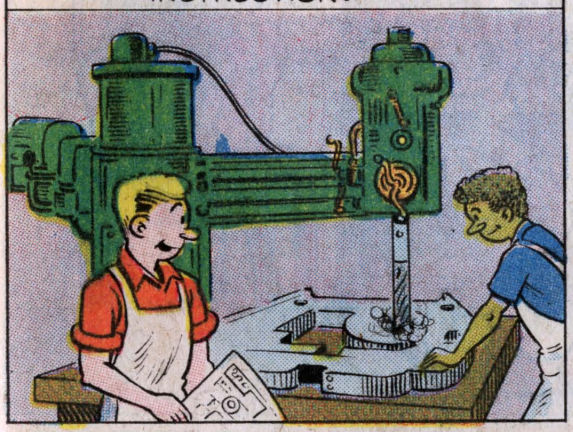
SOME COMPANIES TRAIN THEIR EXPERIENCED MACHINISTS TO USE NEW MACHINE TOOLS COMING INTO USE.



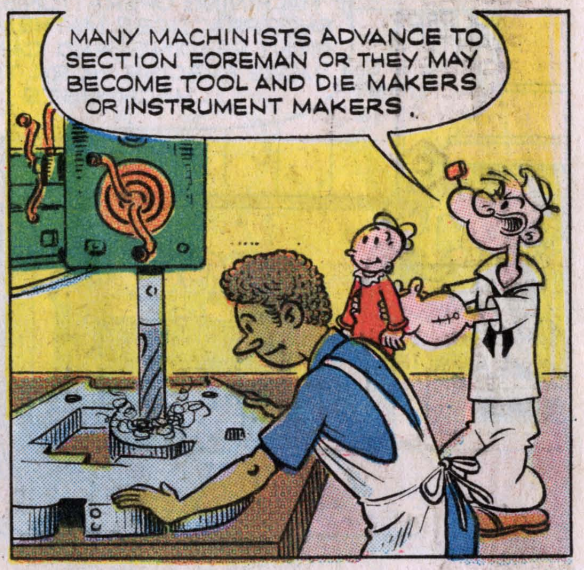
MACHINE EQUIPMENT BUILDERS USUALLY PROVIDE TRAINING IN THE ELECTRICAL AND HYDRAULIC CONTROL SYSTEMS ON NEW MACHINES.



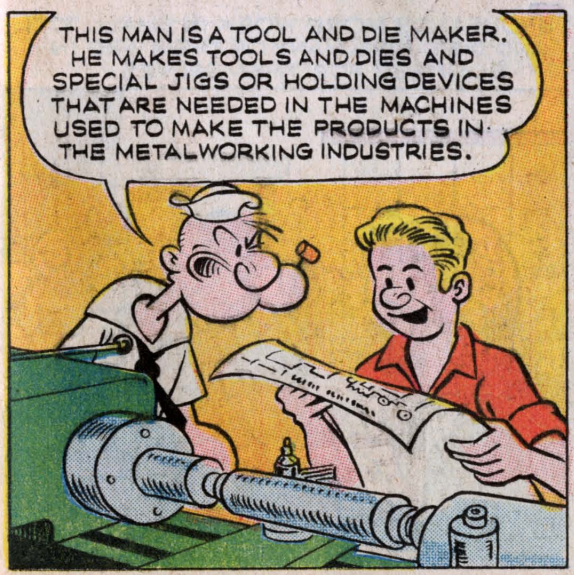
AN APPRENTICE PROGRAM OFTEN LASTS 4 YEARS OR ABOUT 8,000 HOURS OF MACHINE SHOP TRAINING, WITH ANOTHER 570 HOURS OF CLASSROOM INSTRUCTION.



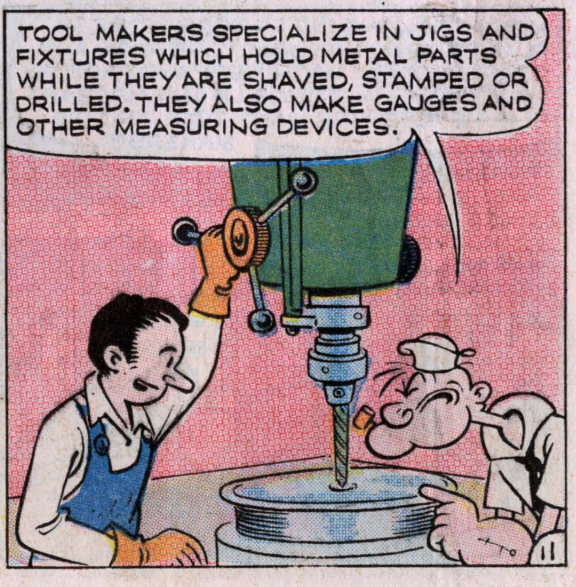
MANY MACHINISTS ADVANCE TO SECTION FOREMAN OR THEY MAY BECOME TOOL AND DIE MAKERS OR INSTRUMENT MAKERS.

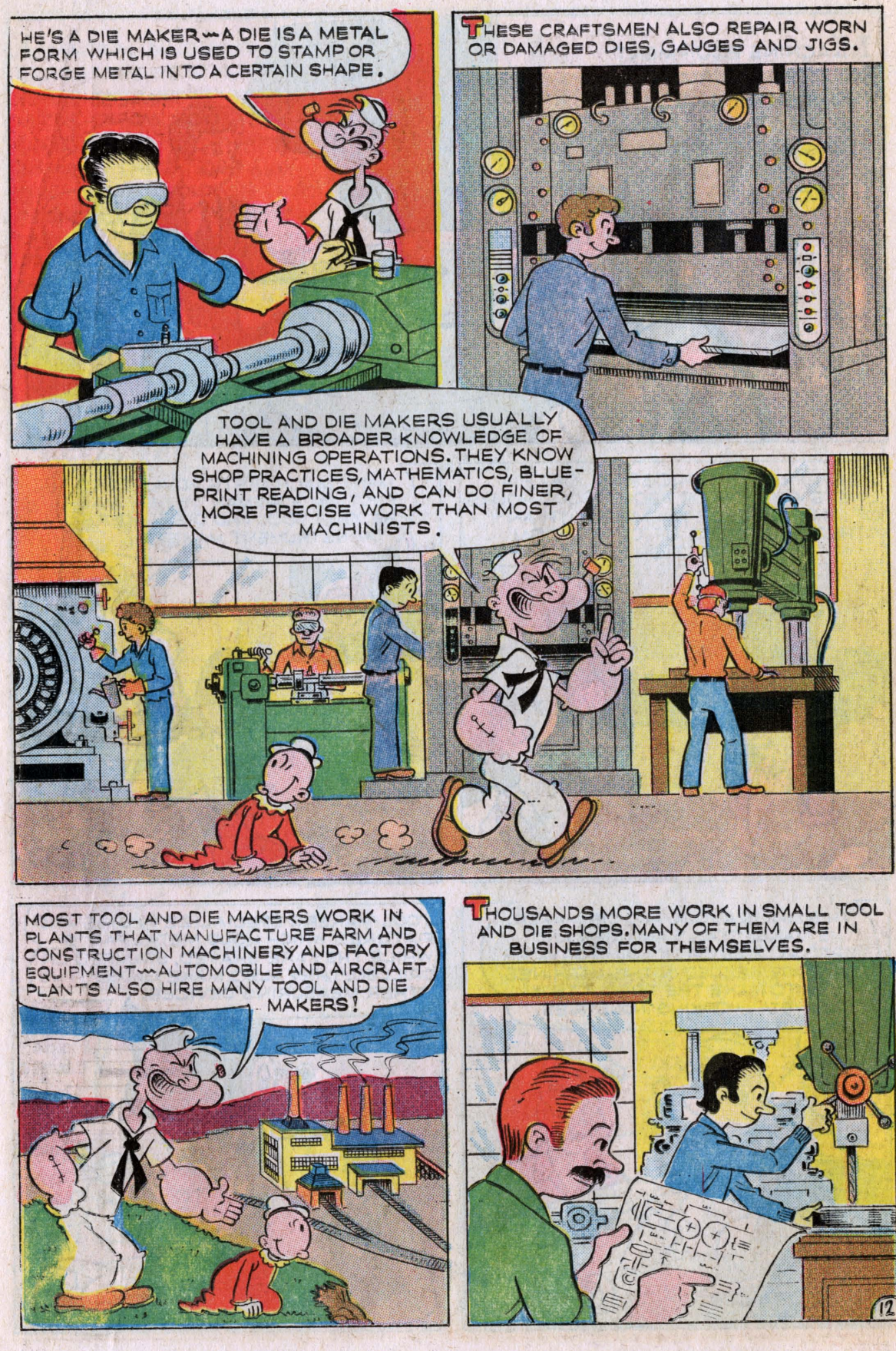


THIS MAN IS A TOOL AND DIE MAKER. HE MAKES TOOLS AND DIES AND SPECIAL JIGS OR HOLDING DEVICES THAT ARE NEEDED IN THE MACHINES USED TO MAKE THE PRODUCTS IN THE METALWORKING INDUSTRIES.

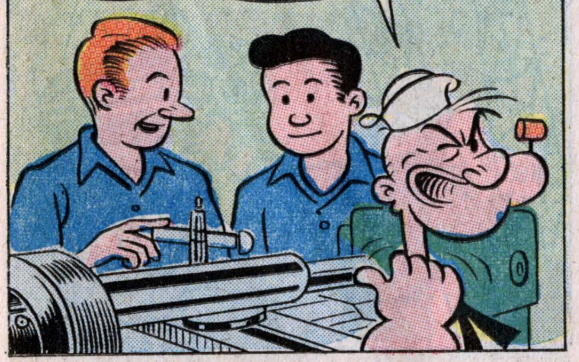


TOOL MAKERS SPECIALIZE IN JIGS AND FIXTURES WHICH HOLD METAL PARTS WHILE THEY ARE SHAVED, STAMPED OR DRILLED. THEY ALSO MAKE GAUGES AND OTHER MEASURING DEVICES.

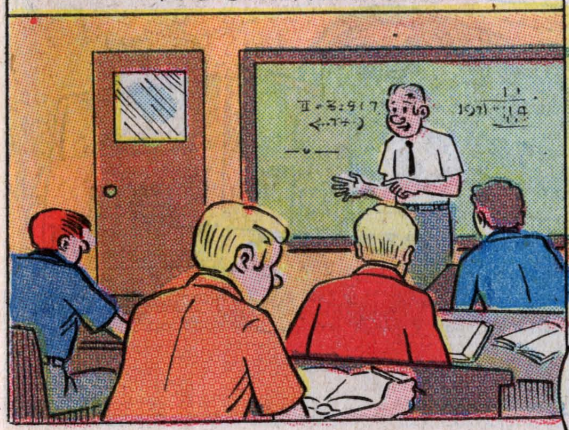



HE'S A DIE MAKER—A DIE IS A METAL FORM WHICH IS USED TO STAMP OR FORGE METAL INTO A CERTAIN SHAPE.
THESE CRAFTSMEN ALSO REPAIR WORN OR DAMAGED DIES, GAUGES AND JIGS.
TOOL AND DIE MAKERS USUALLY HAVE A BROADER KNOWLEDGE OF MACHINING OPERATIONS. THEY KNOW SHOP PRACTICES, MATHEMATICS, BLUE-PRINT READING, AND CAN DO FINER, MORE PRECISE WORK THAN MOST MACHINISTS.
MOST TOOL AND DIE MAKERS WORK IN PLANTS THAT MANUFACTURE FARM AND CONSTRUCTION MACHINERY AND FACTORY EQUIPMENT—AUTOMOBILE AND AIRCRAFT PLANTS ALSO HIRE MANY TOOL AND DIE MAKERS!
THOUSANDS MORE WORK IN SMALL TOOL AND DIE SHOPS. MANY OF THEM ARE IN BUSINESS FOR THEMSELVES.

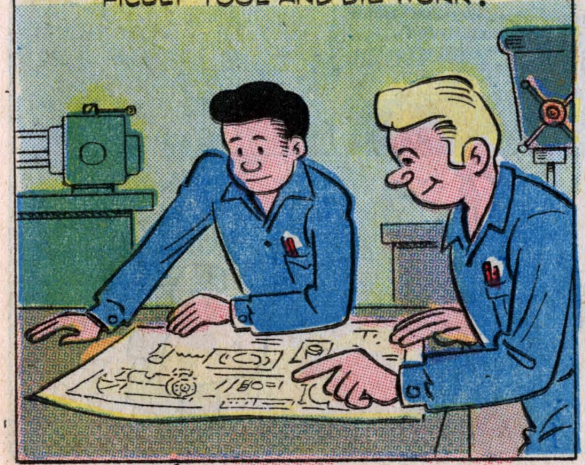
A TOOL AND DIE APPRENTICESHIP LASTS 4 OR 5 YEARS. MOST OF THIS TIME IS DEVOTED TO PRACTICAL SHOP TRAINING WHICH INCLUDES THE USE OF THE DRILL-PRESS, MILLING MACHINE, LATHE, GRINDER AND OTHER MACHINES.



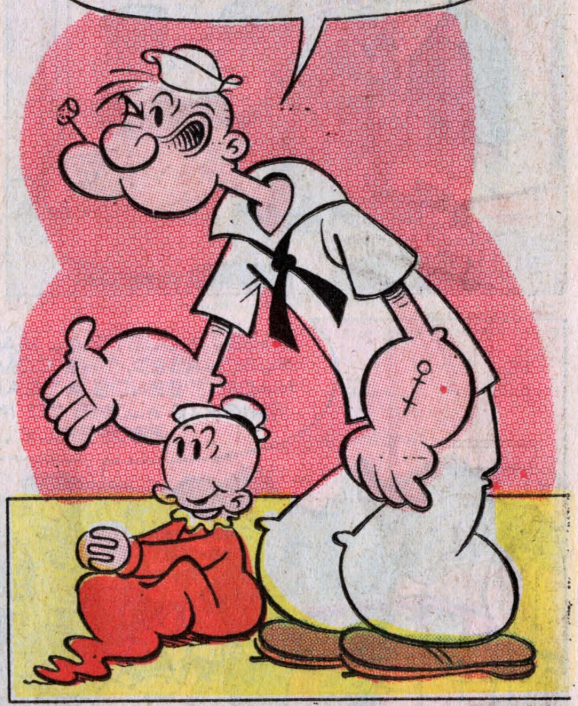
CLASSROOM WORK IS MORE AND MORE IMPORTANT NOW AND INCLUDES SHOP MATHEMATICS, SHOP THEORY, MECHANICAL DRAWING, TOOL DESIGNING AND OTHER THINGS.



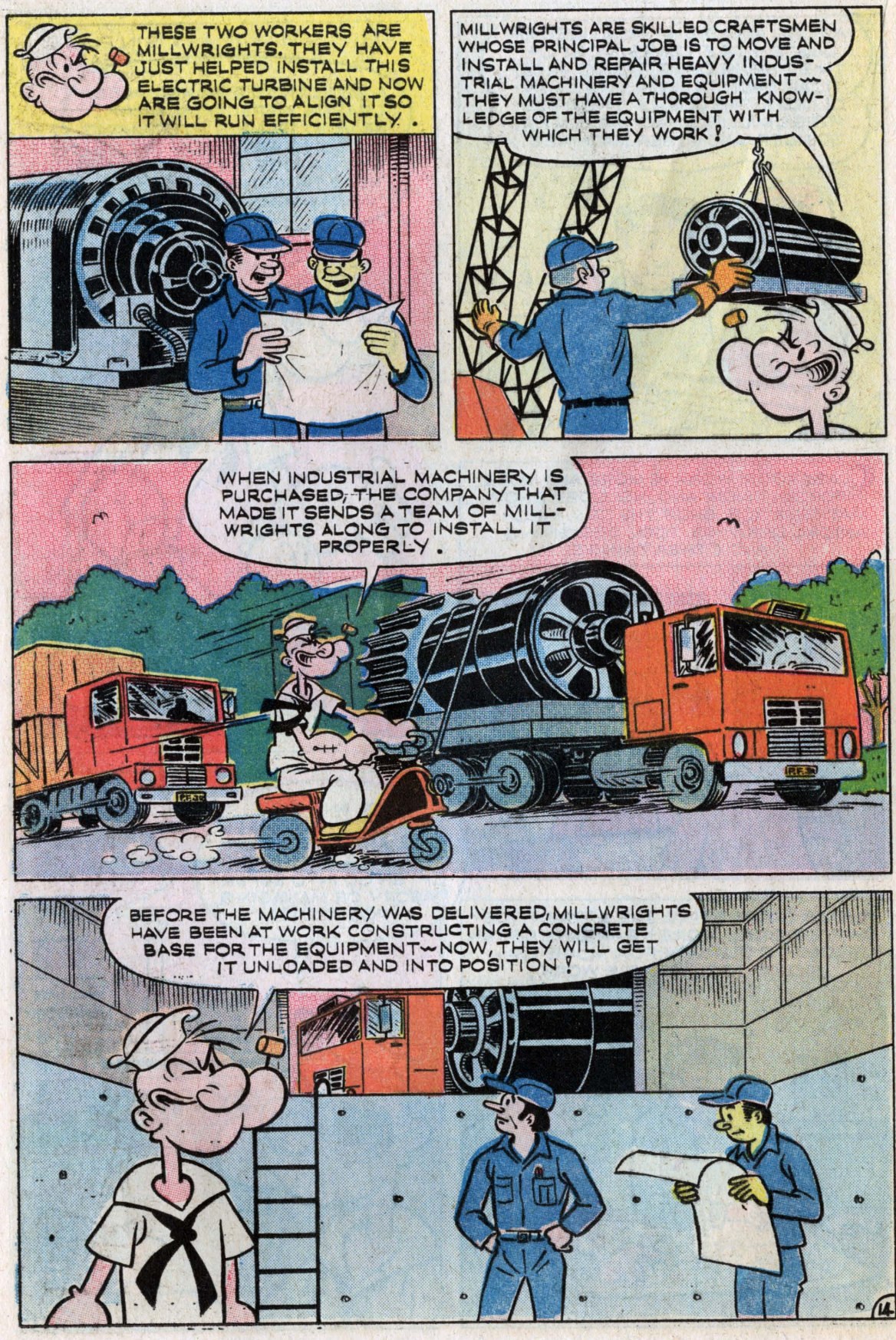
AFTER COMPLETING THE APPRENTICESHIP, SEVERAL MORE YEARS ARE OFTEN NEEDED TO QUALIFY FOR MORE DIFFICULT TOOL AND DIE WORK.

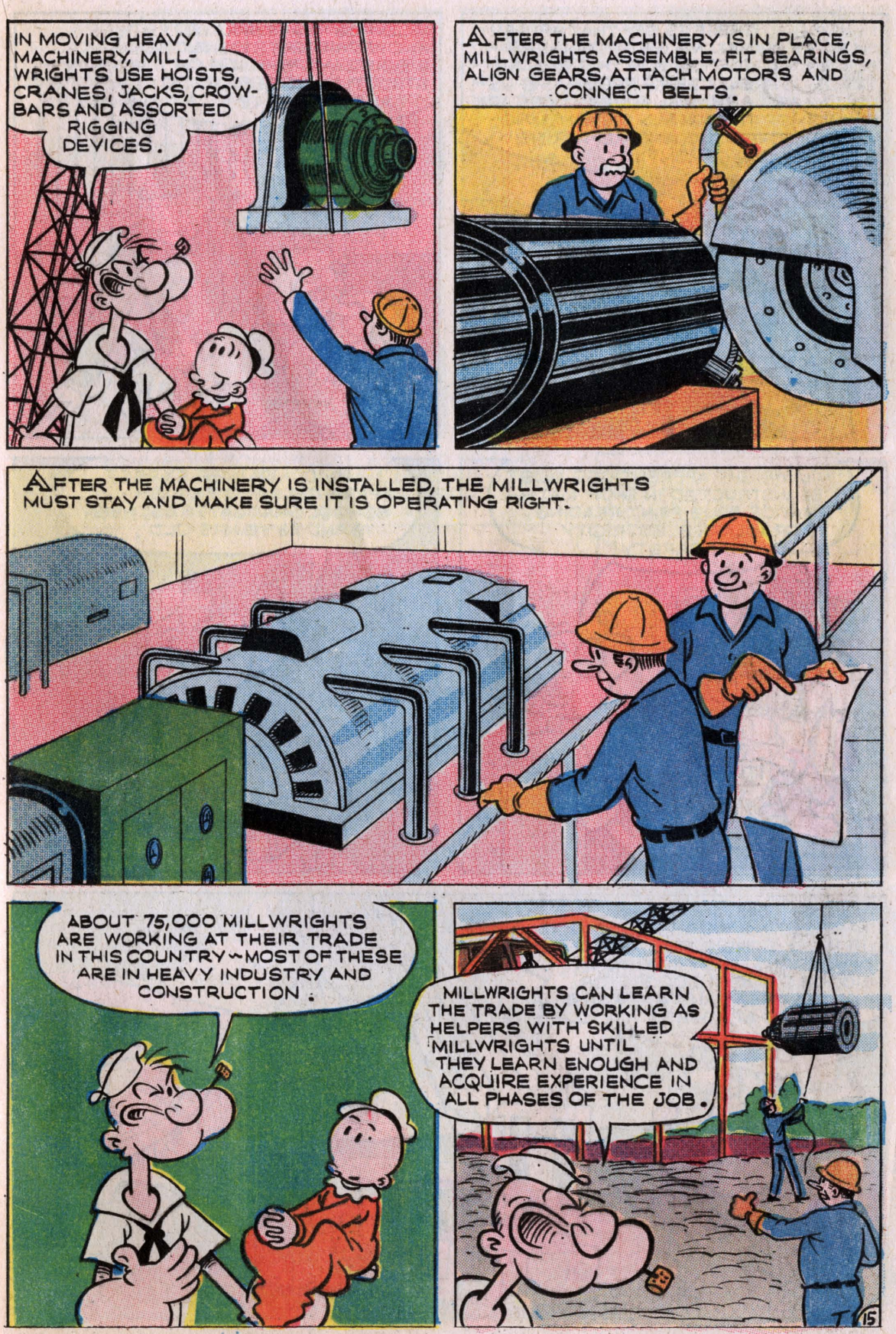


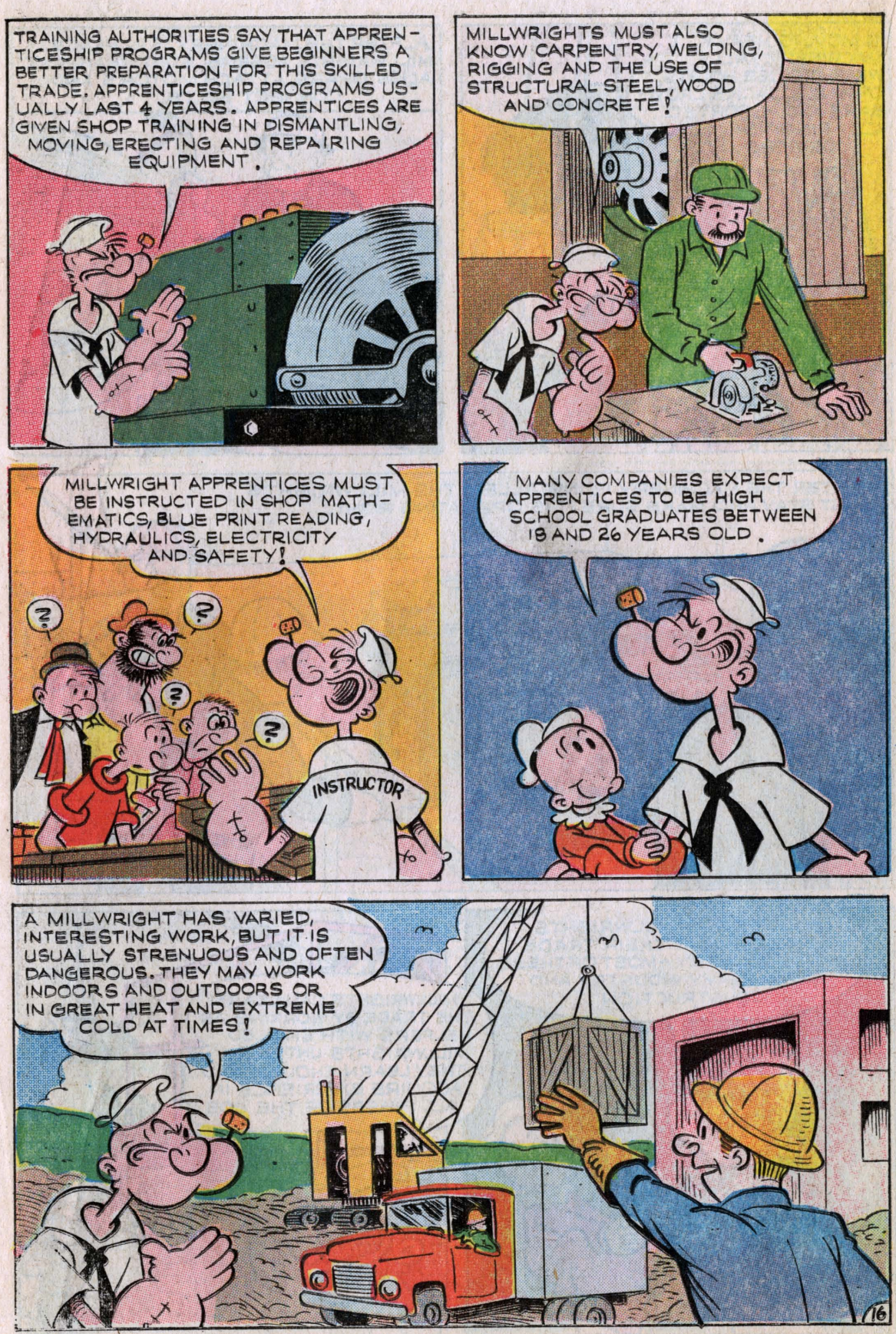
A TOOL AND DIE MAKER ALSO LEARNS INSPECTION WORK. HE MUST BE ABLE TO USE HAND TOOLS, TO ASSEMBLE TOOLS AND GAUGES. HE HAS TO STUDY HEAT TREATING AND OTHER METALWORKING PROCESSES!

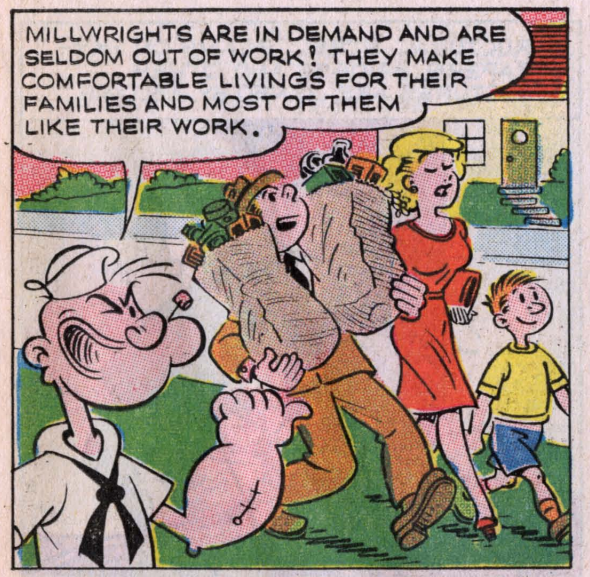


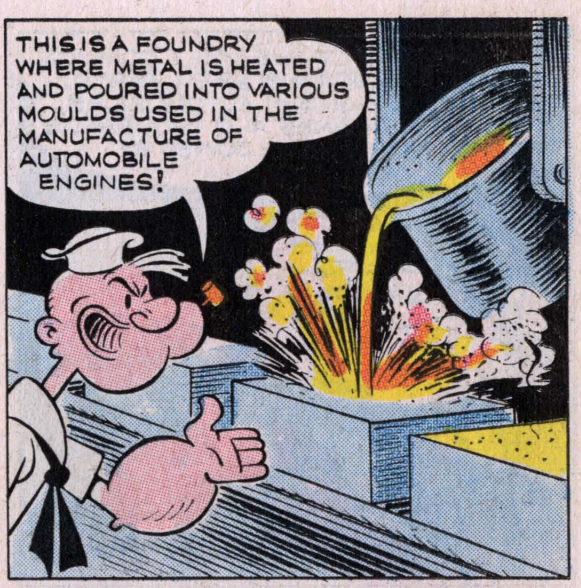
TOOL AND DIE MAKERS HAVE A WIDE KNOWLEDGE OF METALWORKING AND OFTEN GO INTO SUPERVISORY OR MANAGING POSITIONS!


THESE TWO WORKERS ARE MILLWRIGHTS. THEY HAVE JUST HELPED INSTALL THIS ELECTRIC TURBINE AND NOW ARE GOING TO ALIGN IT SO IT WILL RUN EFFICIENTLY.
MILLWRIGHTS ARE SKILLED CRAFTSMEN WHOSE PRINCIPAL JOB IS TO MOVE AND INSTALL AND REPAIR HEAVY INDUSTRIAL MACHINERY AND EQUIPMENT — THEY MUST HAVE A THOROUGH KNOWLEDGE OF THE EQUIPMENT WITH WHICH THEY WORK!
WHEN INDUSTRIAL MACHINERY IS PURCHASED, THE COMPANY THAT MADE IT SENDS A TEAM OF MILLWRIGHTS ALONG TO INSTALL IT PROPERLY.
BEFORE THE MACHINERY WAS DELIVERED, MILLWRIGHTS HAVE BEEN AT WORK CONSTRUCTING A CONCRETE BASE FOR THE EQUIPMENT — NOW, THEY WILL GET IT UNLOADED AND INTO POSITION!
14

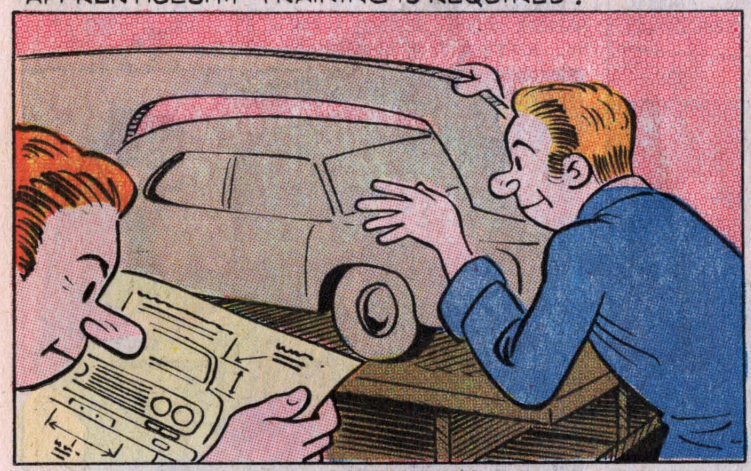

IN MOVING HEAVY MACHINERY, MILLWRIGHTS USE HOISTS, CRANES, JACKS, CROWBARS AND ASSORTED RIGGING DEVICES.
AFTER THE MACHINERY IS IN PLACE, MILLWRIGHTS ASSEMBLE, FIT BEARINGS, ALIGN GEARS, ATTACH MOTORS AND CONNECT BELTS.
AFTER THE MACHINERY IS INSTALLED, THE MILLWRIGHTS MUST STAY AND MAKE SURE IT IS OPERATING RIGHT.
ABOUT 75,000 MILLWRIGHTS ARE WORKING AT THEIR TRADE IN THIS COUNTRY — MOST OF THESE ARE IN HEAVY INDUSTRY AND CONSTRUCTION.
MILLWRIGHTS CAN LEARN THE TRADE BY WORKING AS HELPERS WITH SKILLED MILLWRIGHTS UNTIL THEY LEARN ENOUGH AND ACQUIRE EXPERIENCE IN ALL PHASES OF THE JOB.

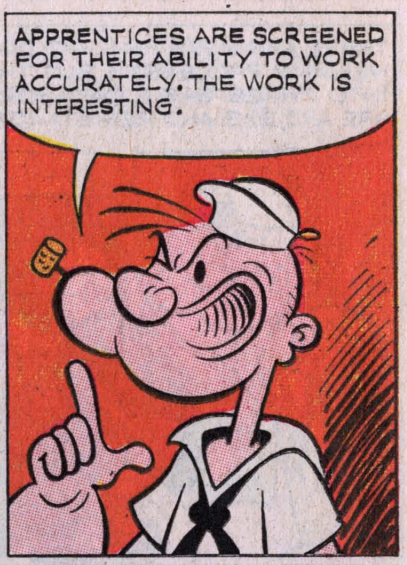

TRAINING AUTHORITIES SAY THAT APPRENTICESHIP PROGRAMS GIVE BEGINNERS A BETTER PREPARATION FOR THIS SKILLED TRADE. APPRENTICESHIP PROGRAMS USUALLY LAST 4 YEARS. APPRENTICES ARE GIVEN SHOP TRAINING IN DISMANTLING, MOVING, ERECTING AND REPAIRING EQUIPMENT.
MILLWRIGHTS MUST ALSO KNOW CARPENTRY, WELDING, RIGGING AND THE USE OF STRUCTURAL STEEL, WOOD AND CONCRETE!
MILLWRIGHT APPRENTICES MUST BE INSTRUCTED IN SHOP MATHEMATICS, BLUE PRINT READING, HYDRAULICS, ELECTRICITY AND SAFETY!
INSTRUCTOR
MANY COMPANIES EXPECT APPRENTICES TO BE HIGH SCHOOL GRADUATES BETWEEN 18 AND 26 YEARS OLD.
A MILLWRIGHT HAS VARIED, INTERESTING WORK, BUT IT IS USUALLY STRENUOUS AND OFTEN DANGEROUS. THEY MAY WORK INDOORS AND OUTDOORS OR IN GREAT HEAT AND EXTREME COLD AT TIMES!
16

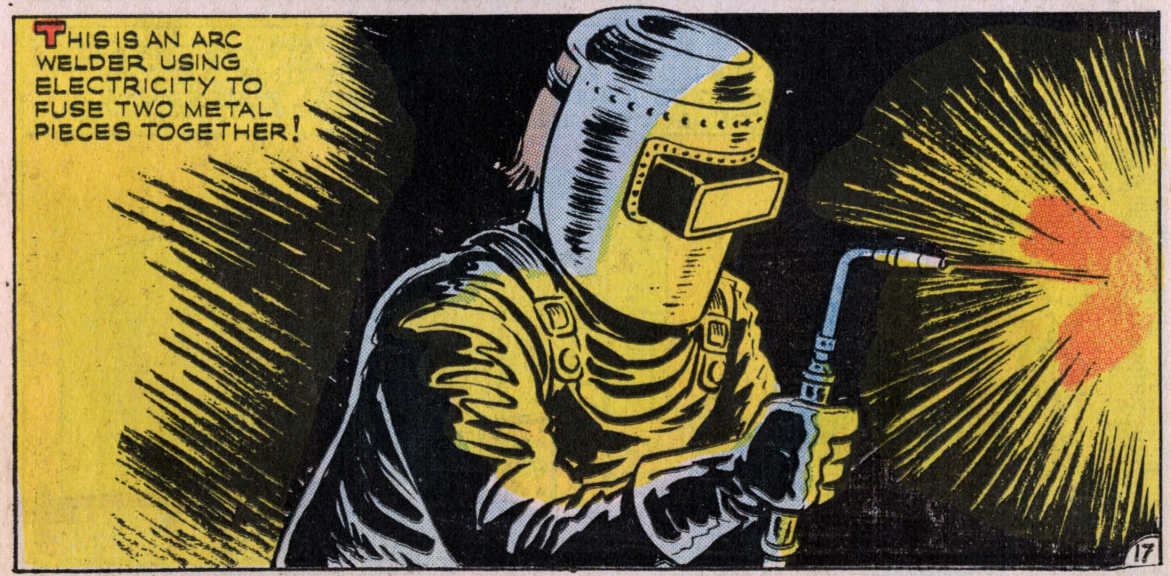

MILLWRIGHTS ARE IN DEMAND AND ARE SELDOM OUT OF WORK! THEY MAKE COMFORTABLE LIVINGS FOR THEIR FAMILIES AND MOST OF THEM LIKE THEIR WORK.

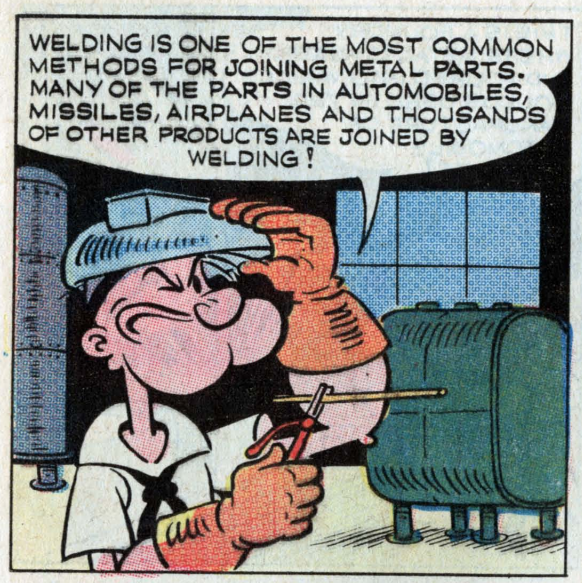


A PATTERNMAKER CONSTRUCTS A WOOD OR CLAY MODEL IN THE SHAPE OF THE FINAL CASTING — THIS IS A HIGHLY-SKILLED TRADE AND THE USUAL APPRENTICESHIP TRAINING IS REQUIRED.

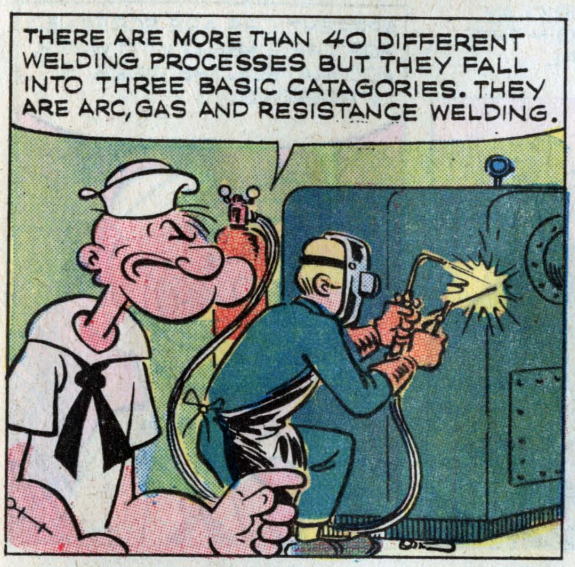


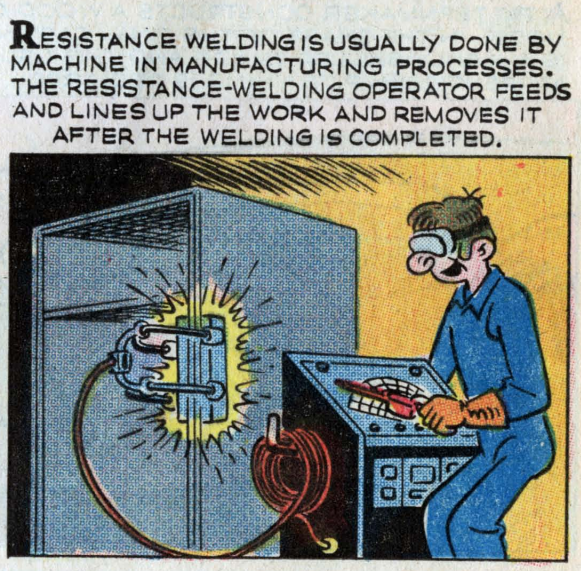


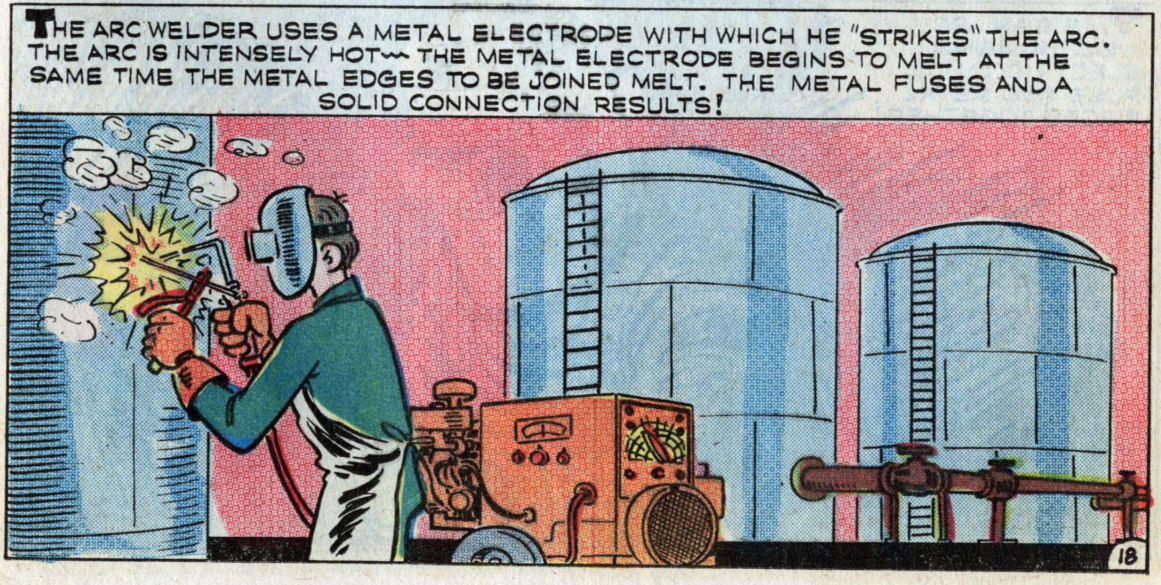



WELDING IS ONE OF THE MOST COMMON METHODS FOR JOINING METAL PARTS. MANY OF THE PARTS IN AUTOMOBILES, MISSILES, AIRPLANES AND THOUSANDS OF OTHER PRODUCTS ARE JOINED BY WELDING!

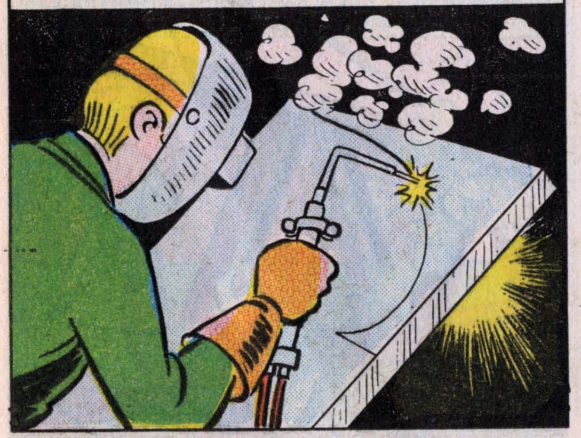
STRUCTURAL STEEL BEAMS ON SKY-SCRAPERS, BRIDGES AND OTHER STRUCTURES ARE JOINED BY WELDING.


THERE ARE MORE THAN 40 DIFFERENT WELDING PROCESSES BUT THEY FALL INTO THREE BASIC CATAGORIES. THEY ARE ARC, GAS AND RESISTANCE WELDING.

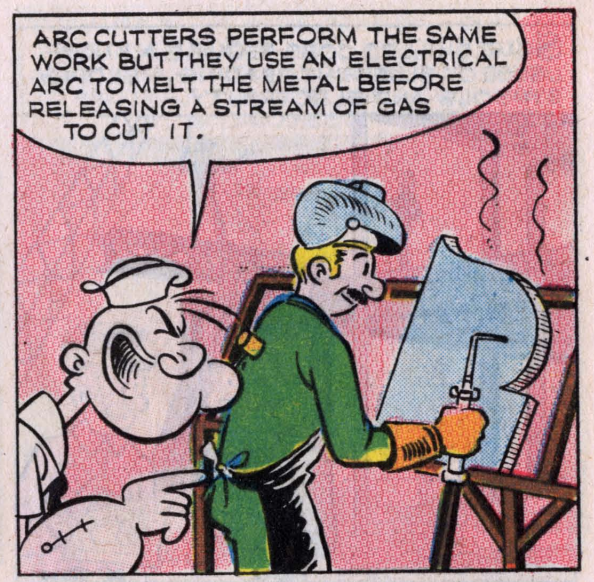

RESISTANCE WELDING IS USUALLY DONE BY MACHINE IN MANUFACTURING PROCESSES. THE RESISTANCE-WELDING OPERATOR FEEDS AND LINES UP THE WORK AND REMOVES IT AFTER THE WELDING IS COMPLETED.


THE ARC WELDER USES A METAL ELECTRODE WITH WHICH HE "STRIKES" THE ARC. THE ARC IS INTENSELY HOT— THE METAL ELECTRODE BEGINS TO MELT AT THE SAME TIME THE METAL EDGES TO BE JOINED MELT. THE METAL FUSES AND A SOLID CONNECTION RESULTS!
18

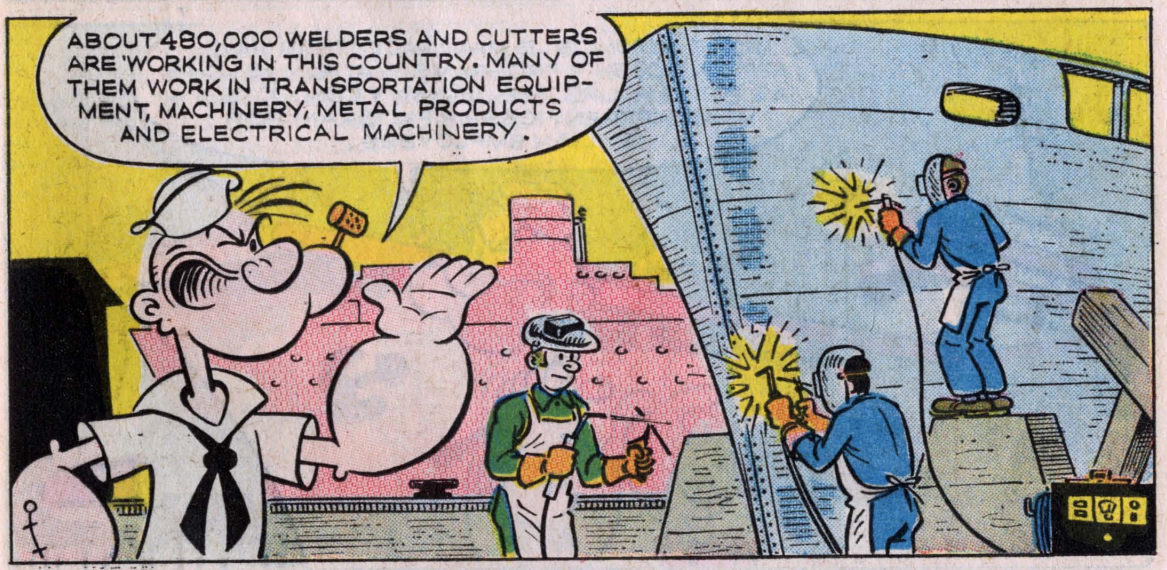
VERY SIMILAR TO WELDING IS OXYGEN AND ARC CUTTING. OXYGEN CUTTERS USE GAS AND OXYGEN FLAME TO HEAT METAL UNTIL IT BEGINS TO MELT, THEN USE ADDITIONAL OXYGEN WHICH CUTS THE METAL.



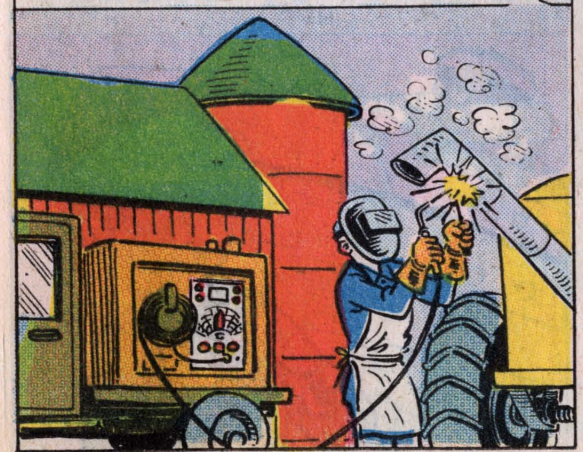
ARC CUTTERS PERFORM THE SAME WORK BUT THEY USE AN ELECTRICAL ARC TO MELT THE METAL BEFORE RELEASING A STREAM OF GAS TO CUT IT.



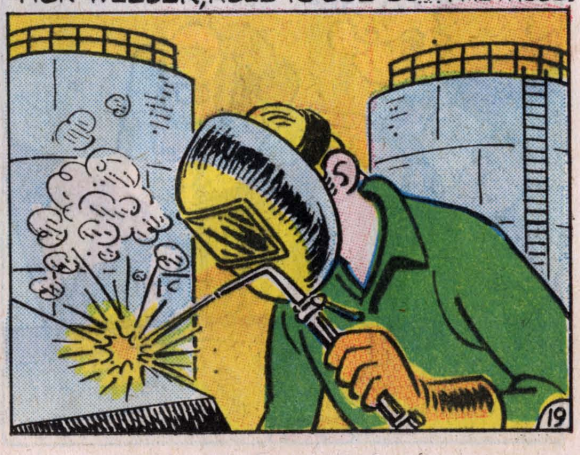
ABOUT 480,000 WELDERS AND CUTTERS ARE WORKING IN THIS COUNTRY. MANY OF THEM WORK IN TRANSPORTATION EQUIPMENT, MACHINERY, METAL PRODUCTS AND ELECTRICAL MACHINERY.



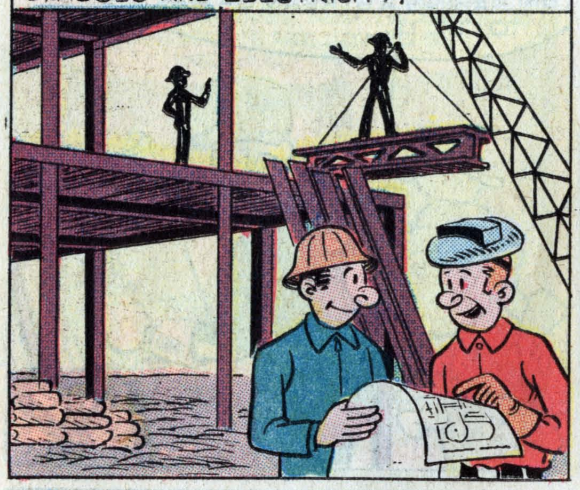
WELDERS FIND JOBS EVERYWHERE; IN RURAL AREAS AS WELL AS IN THE CITIES — THEY WORK FOR THE BIG MANUFACTURERS AND IN SMALL REPAIR SHOPS.



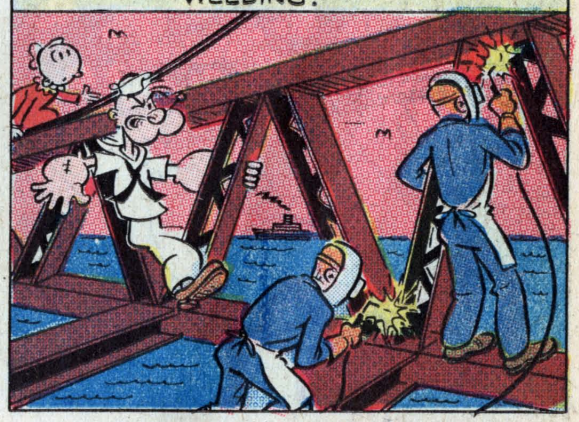
IT USUALLY TAKES SEVERAL YEARS OF TRAINING TO BECOME A SKILLED MANUAL ARC OR GAS WELDER. IT TAKES EVEN LONGER TO BECOME A COMBINATION WELDER, ABLE TO USE BOTH METHODS.

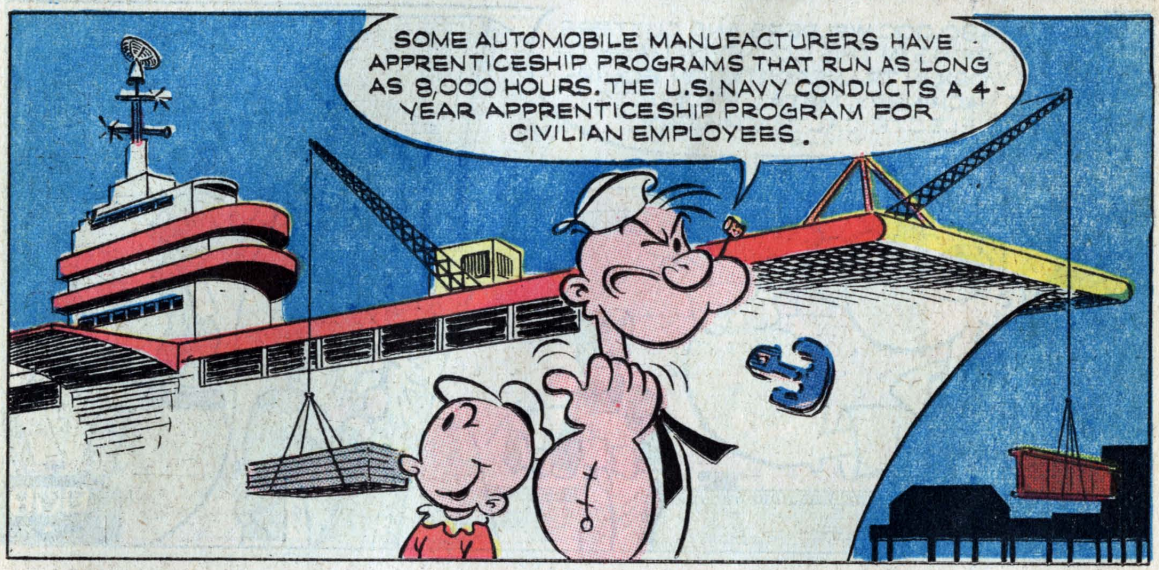


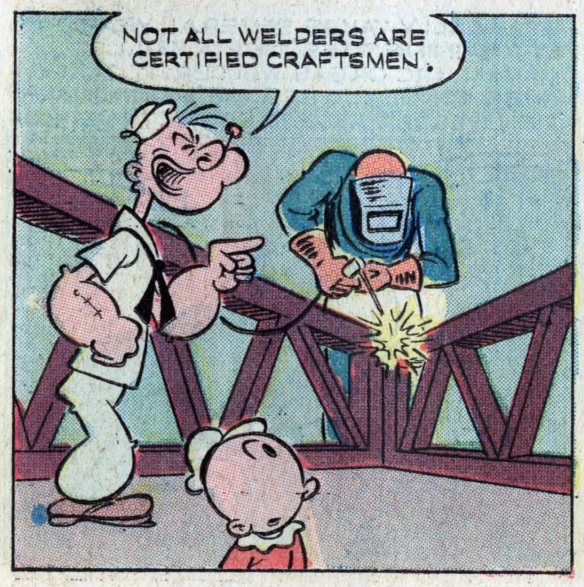
SOME SKILLED JOBS REQUIRE A KNOWLEDGE OF BLUEPRINT READING, WELDING SYMBOLS AND ELECTRICITY.



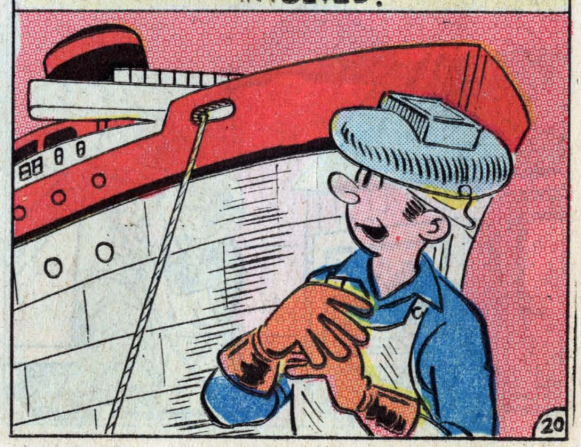
MOST EMPLOYERS PREFER APPRENTICES WHO CAN DO DIFFICULT WORK WITH THEIR HANDS AND WHO HAVE EXCELLENT EYESIGHT. THEY WANT YOUNG MEN WHO HAVE HAD HIGH SCHOOL OR VOCATIONAL TRAINING IN WELDING.



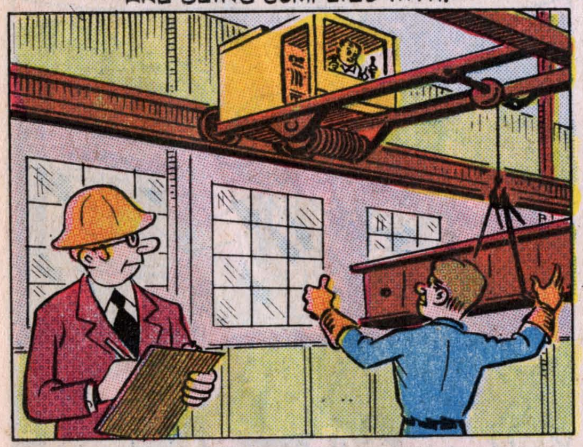

SOME AUTOMOBILE MANUFACTURERS HAVE APPRENTICESHIP PROGRAMS THAT RUN AS LONG AS 8,000 HOURS. THE U.S. NAVY CONDUCTS A 4-YEAR APPRENTICESHIP PROGRAM FOR CIVILIAN EMPLOYEES.



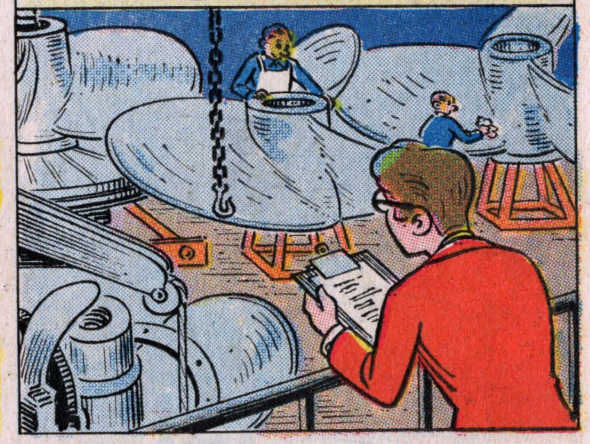
WELDERS IN SOME JOBS MAY BE REQUIRED TO PASS A QUALIFYING EXAMINATION — CERTIFICATION MAY BE REQUIRED ON JOBS WHERE CRITICAL FACTORS ARE INVOLVED.



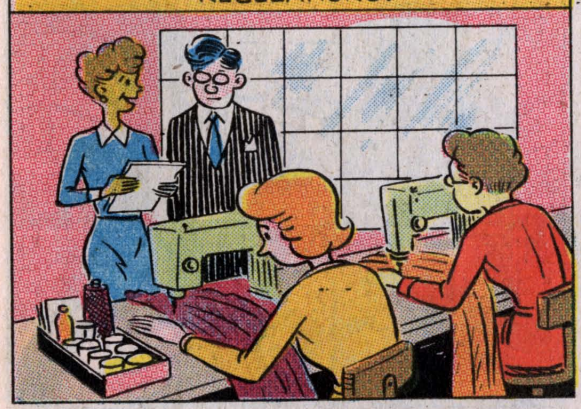
SAFETY ENGINEERS ARE EMPLOYED BY COMPANIES, THE GOVERNMENT AND INSURANCE COMPANIES. THEY CONSTANTLY PATROL WORK AREAS TO MAKE SURE SAFETY REGULATIONS ARE BEING COMPLIED WITH.



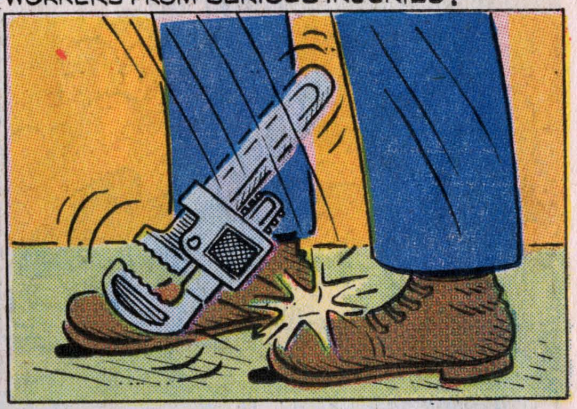
THEY USE THEIR KNOWLEDGE OF INDUSTRIAL PROCESSES, MECHANICS, PSYCHIATRY AND HEALTH AND SAFETY LAWS TO PROTECT THE LIFE AND HEALTH OF EMPLOYEES.



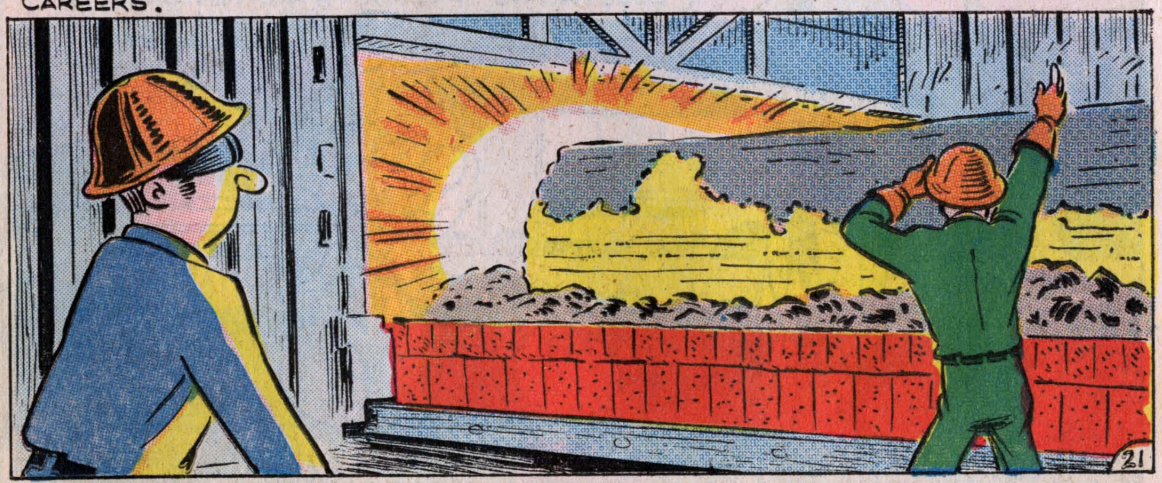
SAFETY ENGINEERS AND INSPECTORS TEST FOR TOXIC OR EXPLOSIVE FUMES. THEY ARE CONSTANTLY AWARE OF HEALTH HAZARDS IN WORK AREAS AND INDUCE EMPLOYERS TO FOLLOW SAFETY REGULATIONS.



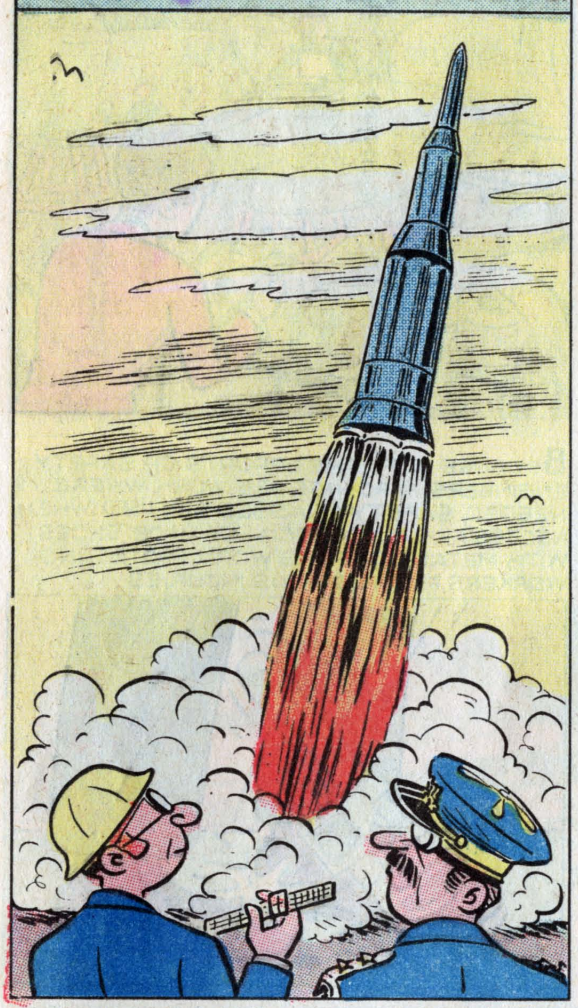
BECAUSE OF THE EFFORTS OF SAFETY ENGINEERS, HARD HATS ARE WORN WHERE NEEDED, SAFETY GLASSES ARE USED WHEN NECESSARY, AND SPECIALLY MADE SHOES WITH METAL TOES ARE WORN, PROTECTING WORKERS FROM SERIOUS INJURIES.



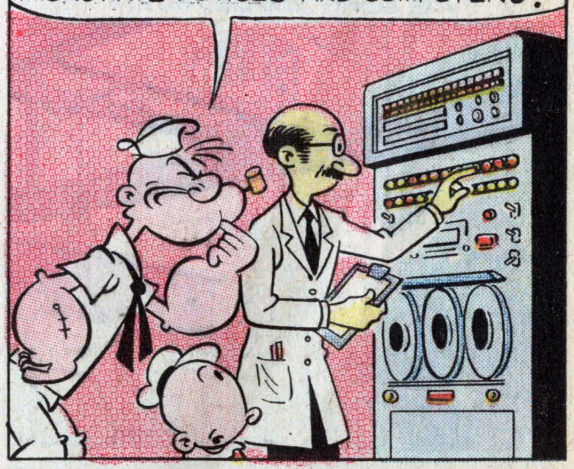
VARIOUS TYPES OF SAFETY ENGINEERS ARE EMPLOYED. SOME RECIEVE ON-THE-JOB TRAINING, OTHERS HAVE A BACHELOR'S DEGREE WITH A MAJOR IN ENGINEERING AND SOME ARE GIVEN COURSES IN SAFETY MANAGEMENT BEFORE BEGINNING THEIR CAREERS.



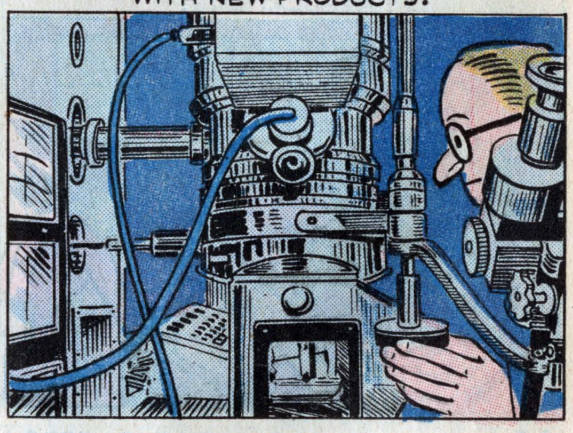
THE FLIGHT OF OUR ASTRONAUTS TO THE MOON, THE PROBING OF THE OCEAN DEPTHS, OR EVEN THE SAFETY OF THE FAMILY CAR, DEPEND IN MANY WAYS ON THE RESEARCH PERFORMED BY PHYSICISTS.



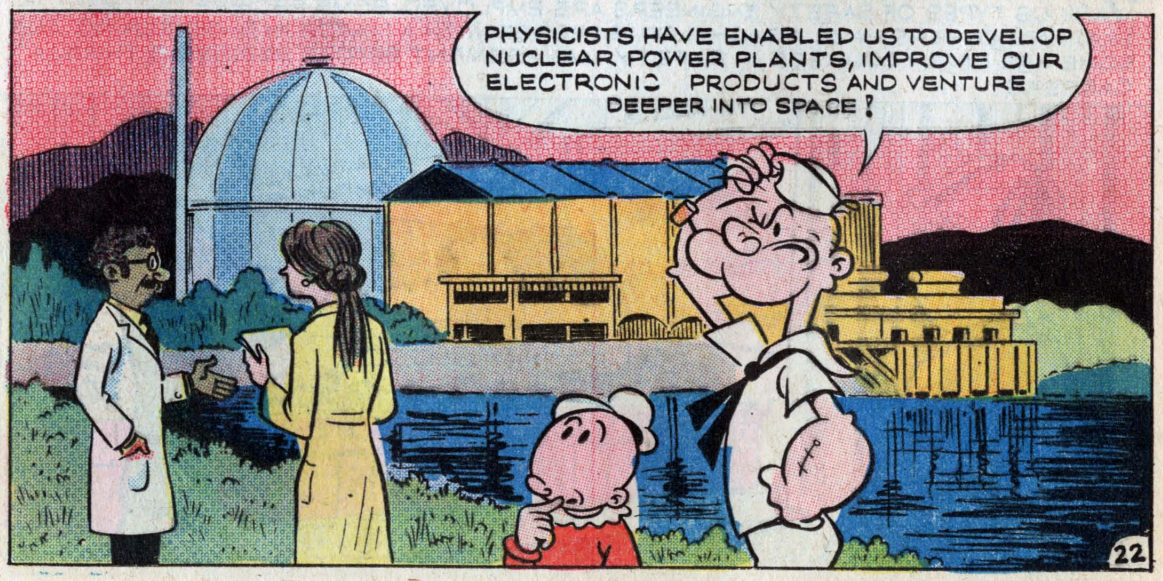
PHYSICISTS USE MANY KINDS OF COMPLICATED EQUIPMENT SUCH AS PARTICLE ACCELERATORS, X-RAY SPECTROMETERS, MICROWAVE DEVICES AND COMPUTERS!

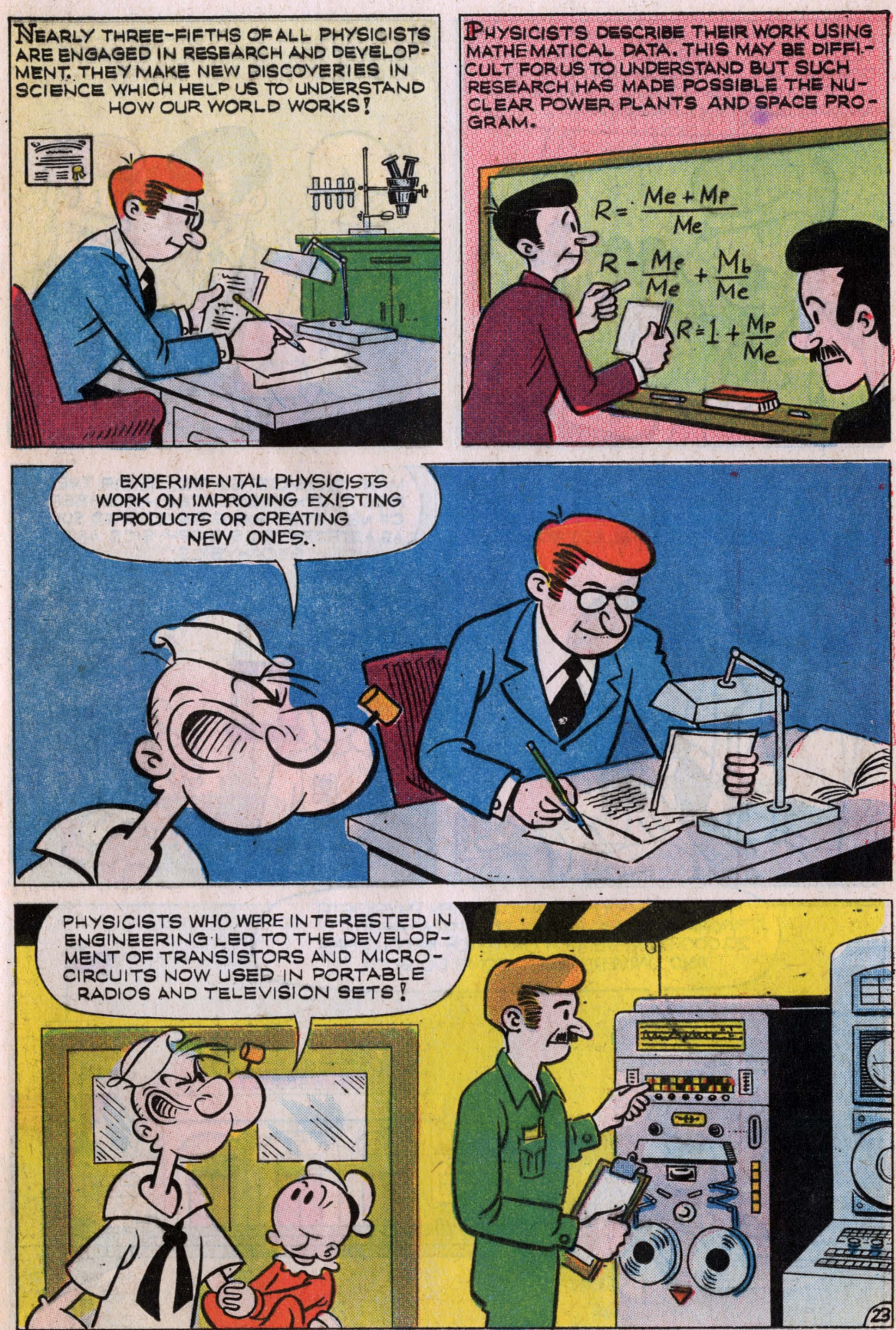


PHYSICISTS ARE LEARNING MORE ABOUT BASIC LAWS OF SCIENCE CONCERNING GRAVITY, ELECTROMAGNETISM, HEAT FLOW AND RADIOACTIVITY. THEIR DISCOVERIES HELP PREVENT DIFFICULTIES WITH NEW PRODUCTS.



PHYSICISTS HAVE ENABLED US TO DEVELOP NUCLEAR POWER PLANTS, IMPROVE OUR ELECTRONIC PRODUCTS AND VENTURE DEEPER INTO SPACE!




NEARLY THREE-FIFTHS OF ALL PHYSICISTS ARE ENGAGED IN RESEARCH AND DEVELOPMENT. THEY MAKE NEW DISCOVERIES IN SCIENCE WHICH HELP US TO UNDERSTAND HOW OUR WORLD WORKS!
PHYSICISTS DESCRIBE THEIR WORK USING MATHEMATICAL DATA. THIS MAY BE DIFFICULT FOR US TO UNDERSTAND BUT SUCH RESEARCH HAS MADE POSSIBLE THE NUCLEAR POWER PLANTS AND SPACE PROGRAM.
R = Me + Mp / Me
R = Me / Me + Mb / Me
R = 1 + Mp / Me
EXPERIMENTAL PHYSICISTS WORK ON IMPROVING EXISTING PRODUCTS OR CREATING NEW ONES..
PHYSICISTS WHO WERE INTERESTED IN ENGINEERING LED TO THE DEVELOPMENT OF TRANSISTORS AND MICRO-CIRCUITS NOW USED IN PORTABLE RADIOS AND TELEVISION SETS!
23

ABOUT ONE-FIFTH OF ALL PHYSICISTS TEACH IN COLLEGES AND UNIVERSITIES. OTHERS ARE IN MANAGEMENT AND ADMINISTRATION, ESPECIALLY IN RESEARCH AND DEVELOPMENT PROGRAMS.
MANY PHYSICISTS SPECIALIZE IN MECHANICS, HEAT TRANSFER, HIGH ENERGY PHYSICS, OPTICS AND SOUND.
A PHYSICIST MAY EVEN SPECIALIZE. WITHIN SOLID-STATE PHYSICS, THIS MAN IS WORKING ON CERAMICS. HIS DISCOVERIES WILL BE USEFUL IN ELECTRONICS.
MANY PHYSICISTS APPLY THEIR THEORIES TO OTHER SCIENCES. A NUMBER OF NEW JOBS HAVE DEVELOPED SUCH AS ASTROPHYSICS, BIOPHYSICS AND GEOPHYSICS.
ABOUT 45,000 MEN AND WOMEN PHYSICISTS WORK FULL TIME IN THIS COUNTRY. ABOUT 20,000 DO RESEARCH OR TEACH IN COLLEGES AND UNIVERSITIES. SOME DO BOTH.
UNIVERSITY
24

A BACHELOR'S DEGREE WITH A MAJOR IN PHYSICS IS THE MINIMUM REQUIREMENT FOR A PHYSICS CAREER—FURTHER TRAINING IS OFTEN NEEDED FOR MANY JOBS. A DOCTOR'S DEGREE IN PHYSICS IS NEEDED TO BE A FULL PROFESSOR IN A UNIVERSITY OR COLLEGE.

A MASTER'S DEGREE IN PHYSICS HELPS YOUNG PHYSICISTS GET A JOB IN INDUSTRIAL OR GOVERNMENT RESEARCH.

MATHEMATICS IS A PROFESSION IN WHICH 65,000 MEN AND WOMEN ARE EMPLOYED!

$$W_m = N^2 \frac{Rh}{n^2}$$
$$B = \frac{Na\ We}{N\ell}$$

MATHEMATICS IS AN ESSENTIAL TOOL—MANY IDEAS CAN ONLY BE EXPRESSED IN MATHEMATICAL TERMS SO AS TO BE UNDERSTOOD BY OTHERS.

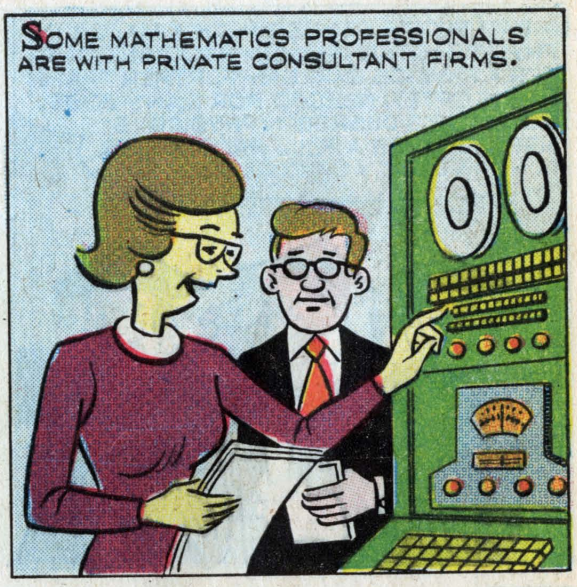
$$W_m = N^2 \frac{Rh}{n^2}$$
$$B = \frac{Na\ We}{N\ell}$$

MATHEMATICS IS ONE OF THE OLDEST AND MOST BASIC OF SCIENCES. AN EARLY START IN MATH LEADS TO MANY CAREERS.

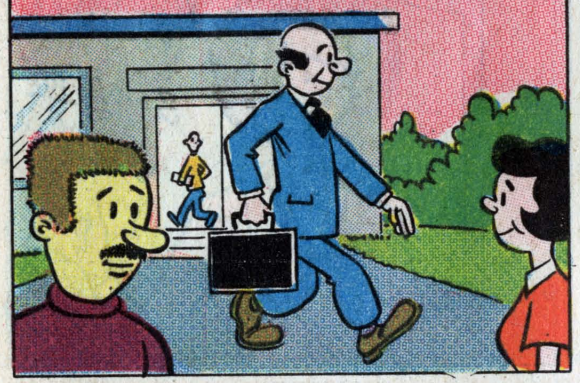
$$\overset{2}{+2} \quad \overset{2}{+3} \quad \overset{2}{+1} \quad \overset{2}{+4} \quad \overset{2}{+7}$$

MORE THAN HALF OF THE 65,000 EMPLOYED MATHEMATICIANS WORK IN PRIVATE INDUSTRY — THEY ARE WITH AIRCRAFT MANUFACTURERS, FIRMS WHICH MAKE MACHINERY AND ELECTRICAL EQUIPMENT, AND COMPANIES INVOLVED IN OUR SPACE PROGRAMS.

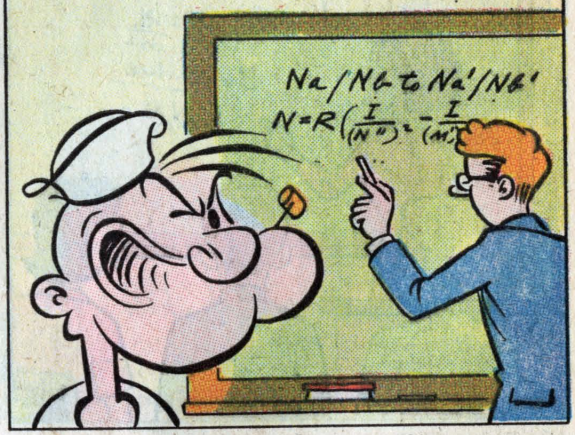
SOME MATHEMATICS PROFESSIONALS ARE WITH PRIVATE CONSULTANT FIRMS.

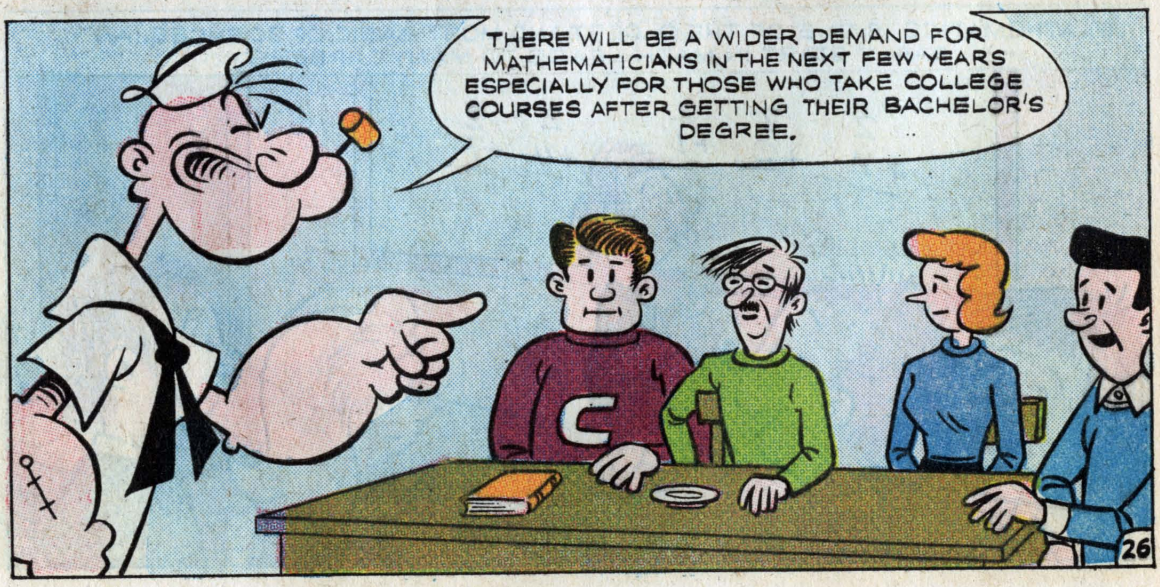


ABOUT ONE THIRD OF ALL MATHEMATICIANS ARE EMPLOYED AT COLLEGES AND UNIVERSITIES. ABOUT HALF OF THESE TEACH, THE REST ARE INVOLVED IN RESEARCH OR EXPERIMENTAL PROJECTS, MAKING NEW DISCOVERIES.

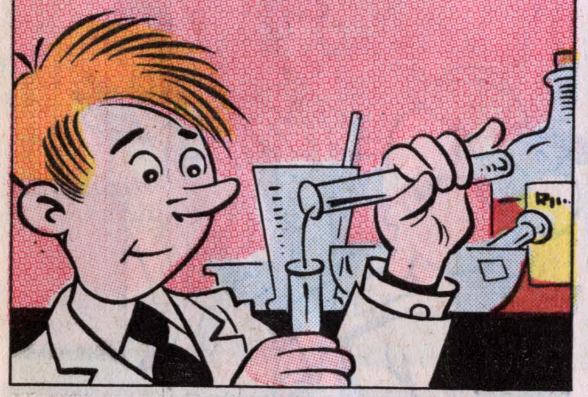


THE MINIMUM EDUCATIONAL REQUIREMENT FOR A BEGINNING POSITION IS A BACHELOR'S DEGREE WITH A MAJOR IN MATHEMATICS, PHYSICS OR ENGINEERING.

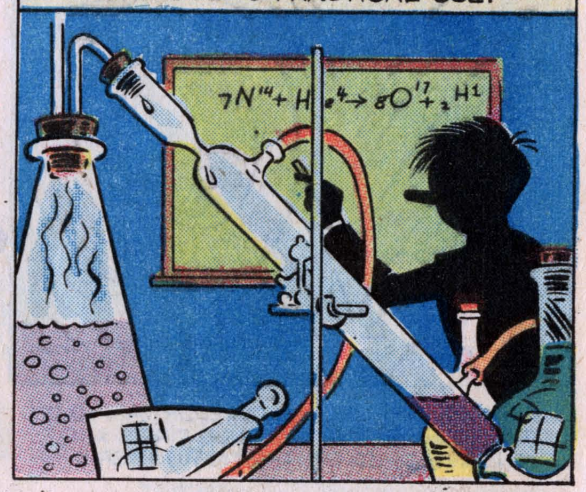



THERE WILL BE A WIDER DEMAND FOR MATHEMATICIANS IN THE NEXT FEW YEARS ESPECIALLY FOR THOSE WHO TAKE COLLEGE COURSES AFTER GETTING THEIR BACHELOR'S DEGREE.

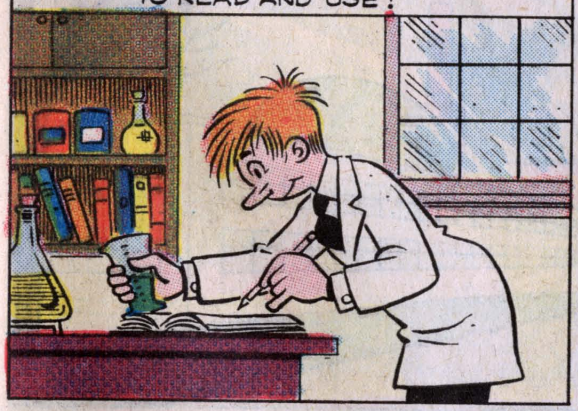
MOST OF THE CLOTHES WE WEAR, MUCH OF THE FOOD WE EAT AND THE FURNITURE AND HOUSES WE LIVE IN ARE THE PRODUCTS OF WORK THE CHEMISTS HAVE DONE!



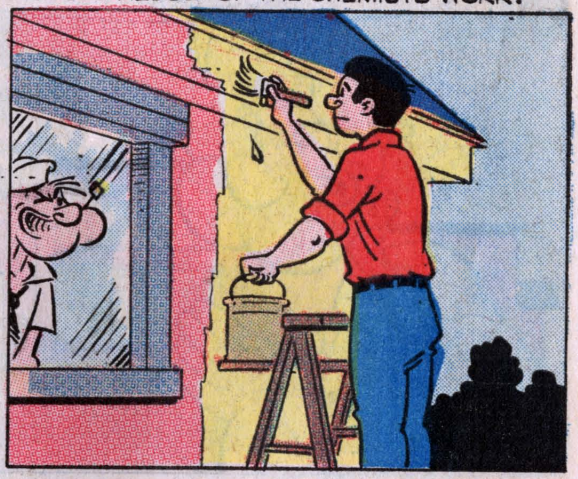
CHEMISTS SEARCH FOR NEW KNOWLEDGE ABOUT SUBSTANCES AND TRY TO PUT THIS KNOWLEDGE TO PRACTICAL USE.



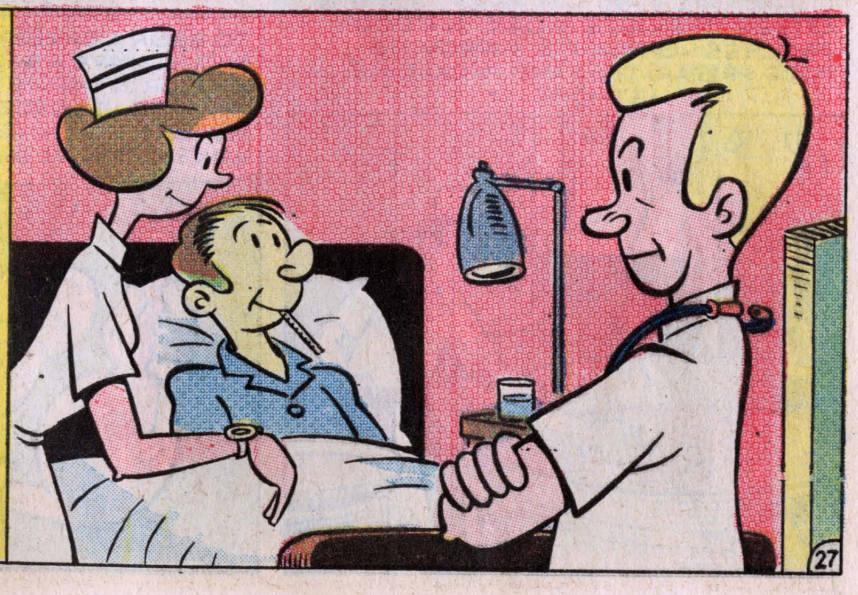
CHEMISTS KEEP ACCURATE RECORDS OF THEIR WORK AND PREPARE CLEAR AND CONCISE REPORTS OF THEIR EXPERIMENTS WHICH ARE PUBLISHED IN SCIENTIFIC PUBLICATIONS FOR OTHER SCIENTISTS TO READ AND USE!

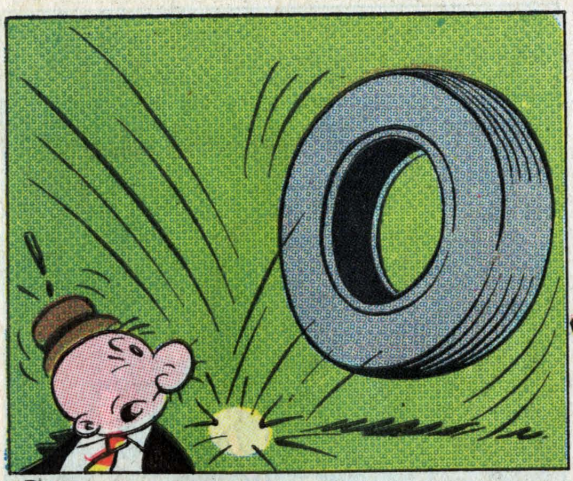


NEW, EASY-TO-APPLY PAINTS WHICH LAST FAR LONGER THAN PAINTS DID IN THE PAST ARE ONE RESULT OF THE CHEMISTS' WORK.



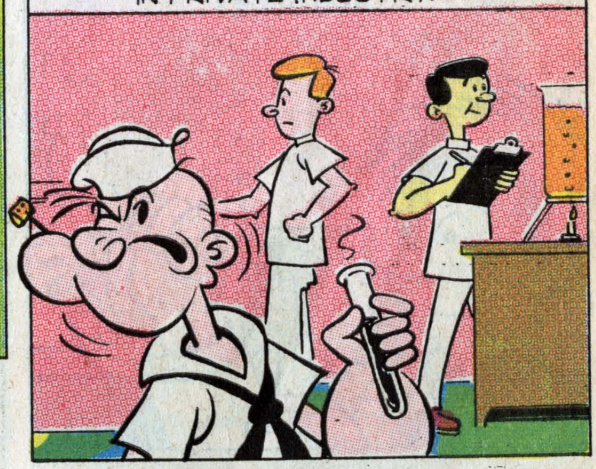
CHEMISTS HAVE HELPED DEVELOP MEDICINES, SAVING THE LIVES OF SICK PEOPLE WHO WOULD HAVE DIED IN OTHER DAYS — CHEMISTS HAVE DEVELOPED DISINFECTANTS WHICH REDUCE INFECTIONS.

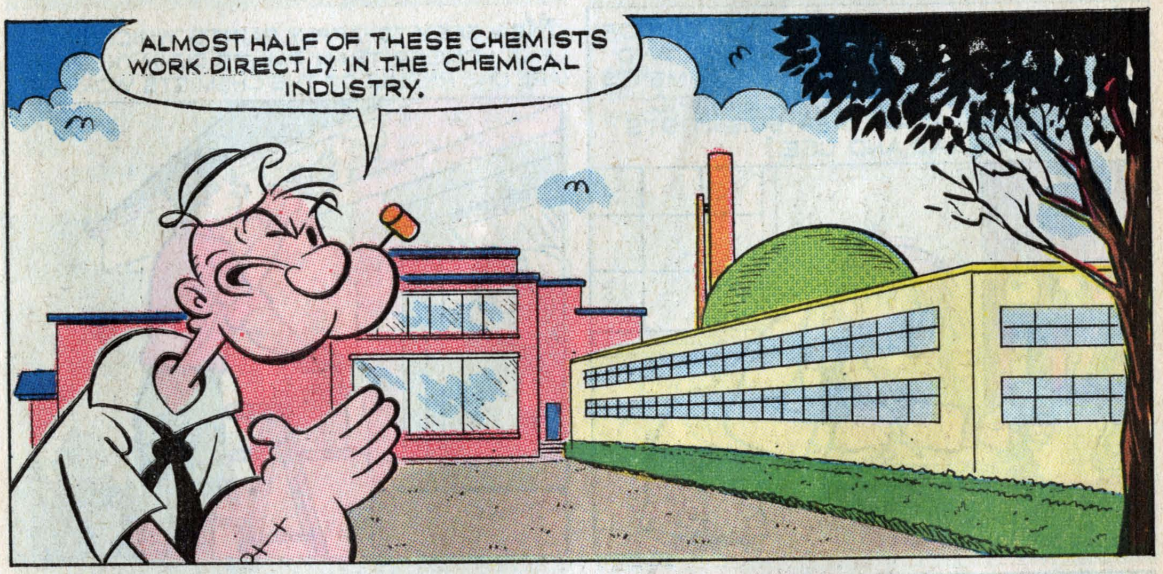




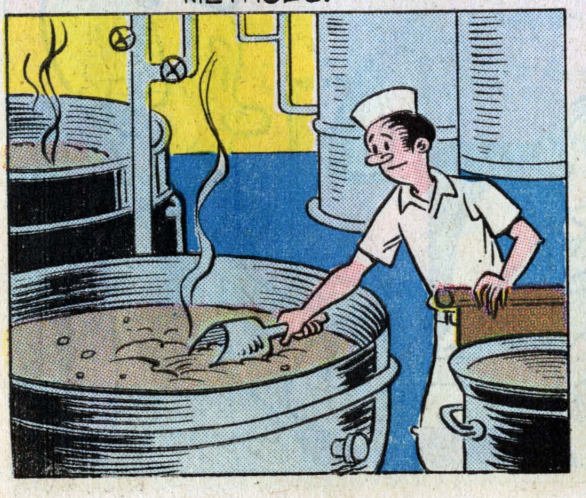
CHEMISTS HAVE HELPED DEVELOP MAN-MADE FIBERS TO USE IN AUTOMOBILE TIRES AND EVEN DEVELOPED SYNTHETIC RUBBER.

MORE THAN 130,000 MEN AND WOMAN CHEMISTS ARE WORKING IN THIS COUNTRY. THREE-FOURTHS OF THEM WORK IN PRIVATE INDUSTRY.

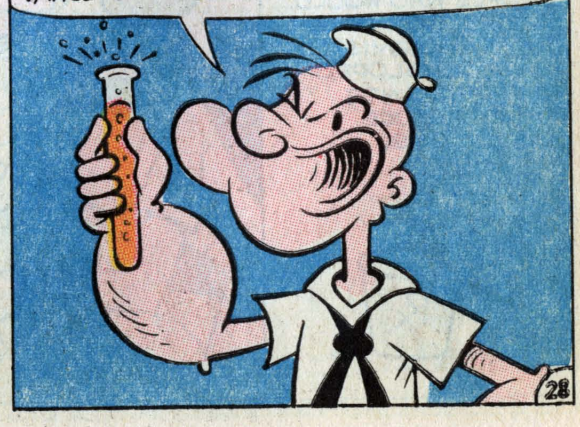




OTHER CHEMISTS WORK IN FOOD PROCESSING PLANTS, IMPROVING FOOD PREPARATION AND PACKAGING METHODS.

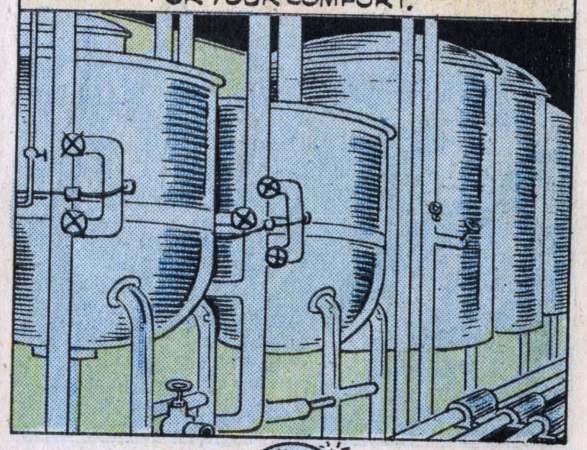


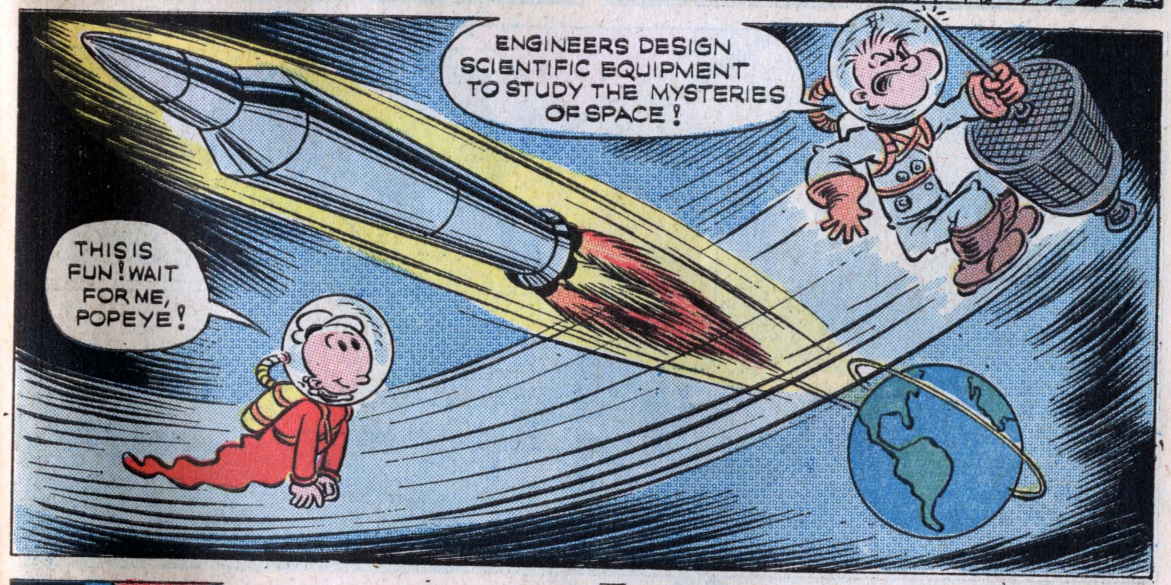
TO BEGIN A CAREER IN CHEMISTRY, YOU SHOULD HAVE A BACHELOR'S DEGREE WITH A MAJOR IN CHEMISTRY — ADDITIONAL TRAINING IS NEEDED FOR JOBS IN RESEARCH, TEACHING AND TO ACHIEVE ADVANCEMENT IN ALL BRANCHES OF CHEMISTRY.

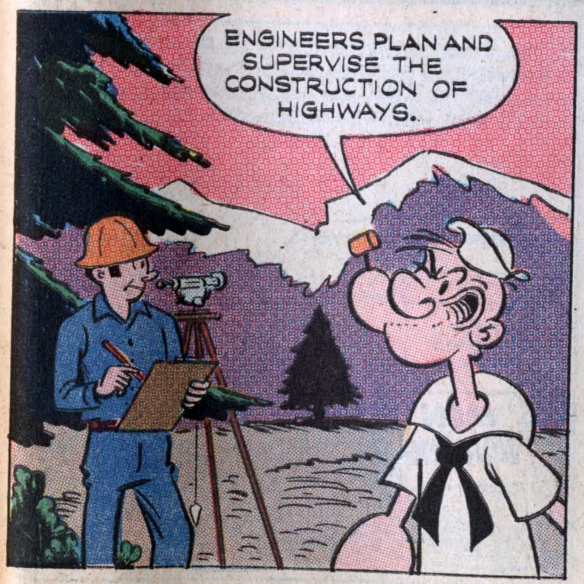


ENGINEERS CONTRIBUTE IN COUNTLESS WAYS TO OUR LIFE. THEY DEVELOP ELECTRIC GENERATORS, CLEAN WATER SUPPLY AND WASTE DISPOSAL SYSTEMS.

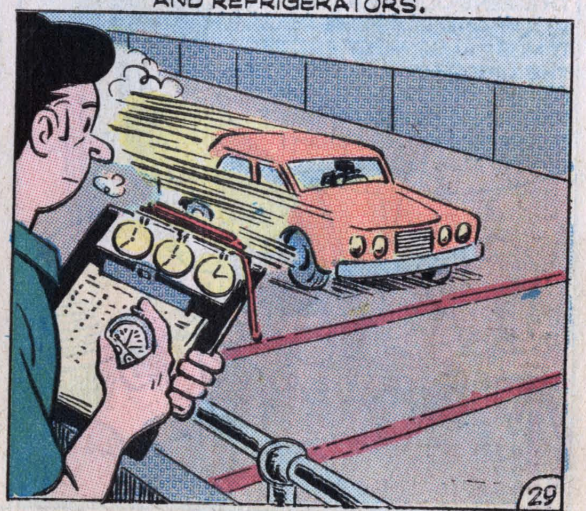
THEY DESIGN INDUSTRIAL MACHINERY AND EQUIPMENT FOR LARGE FACTORIES. THEY ALSO DEVELOP HEATING, AIR CONDITIONING AND VENTILATION EQUIPMENT FOR YOUR COMFORT.

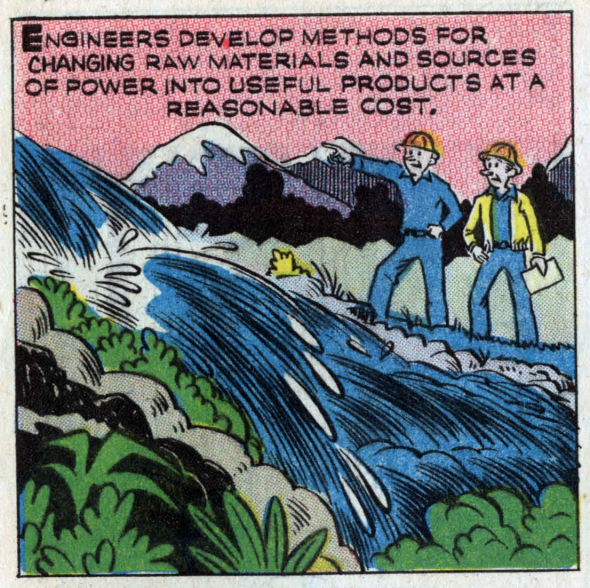


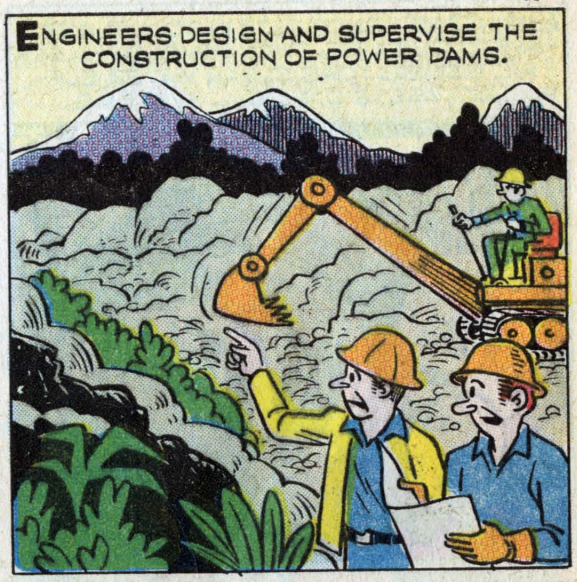


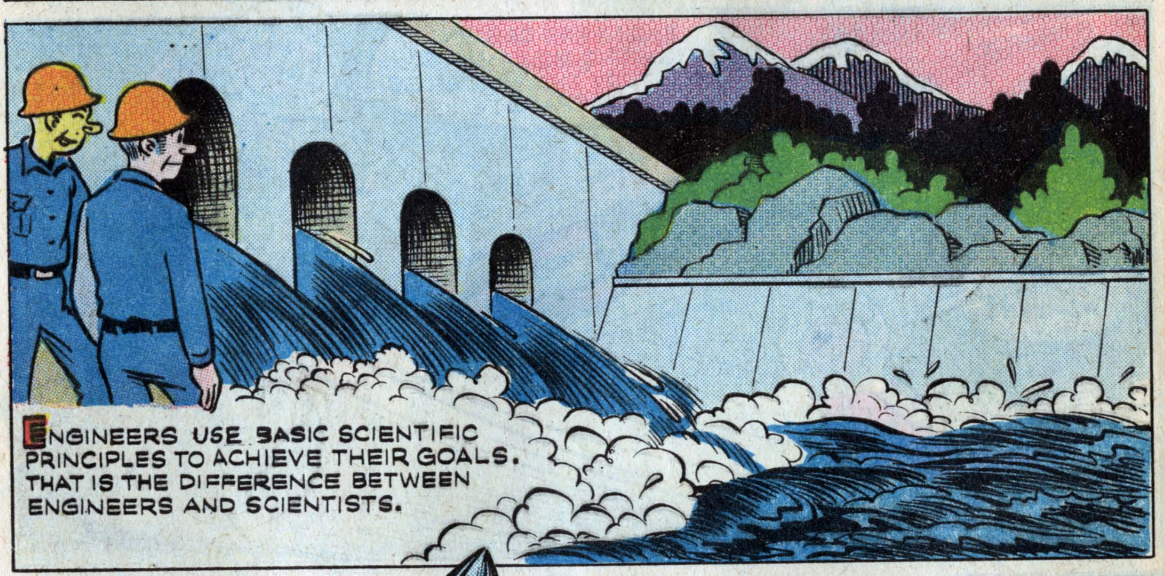


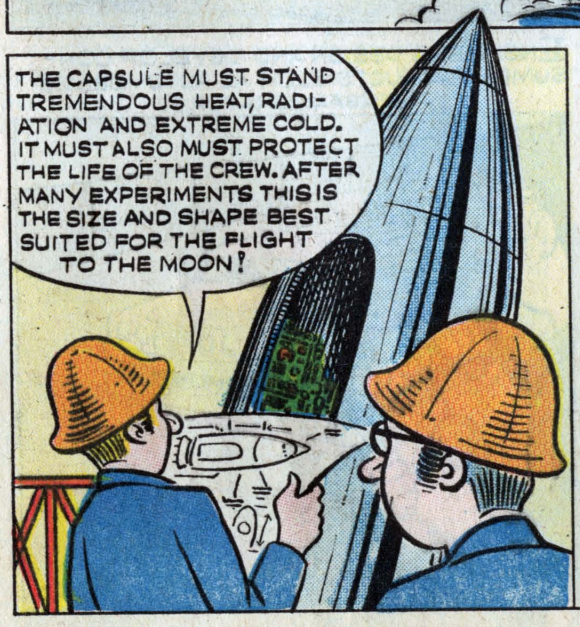
ENGINEERS DESIGN AND DEVELOP CONSUMER PRODUCTS SUCH AS AUTOMOBILES AND REFRIGERATORS.

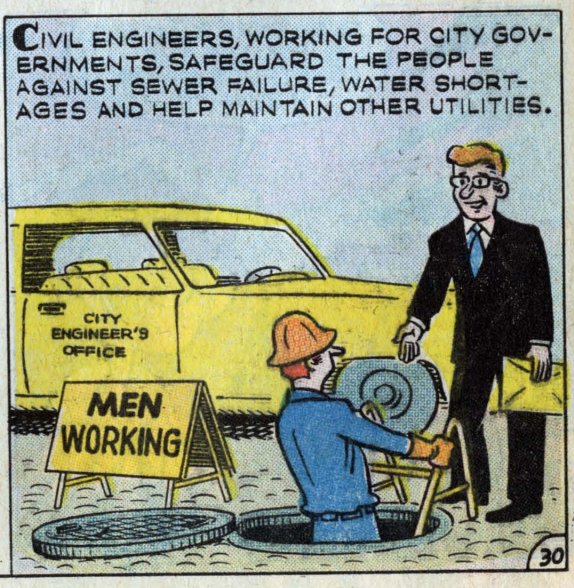


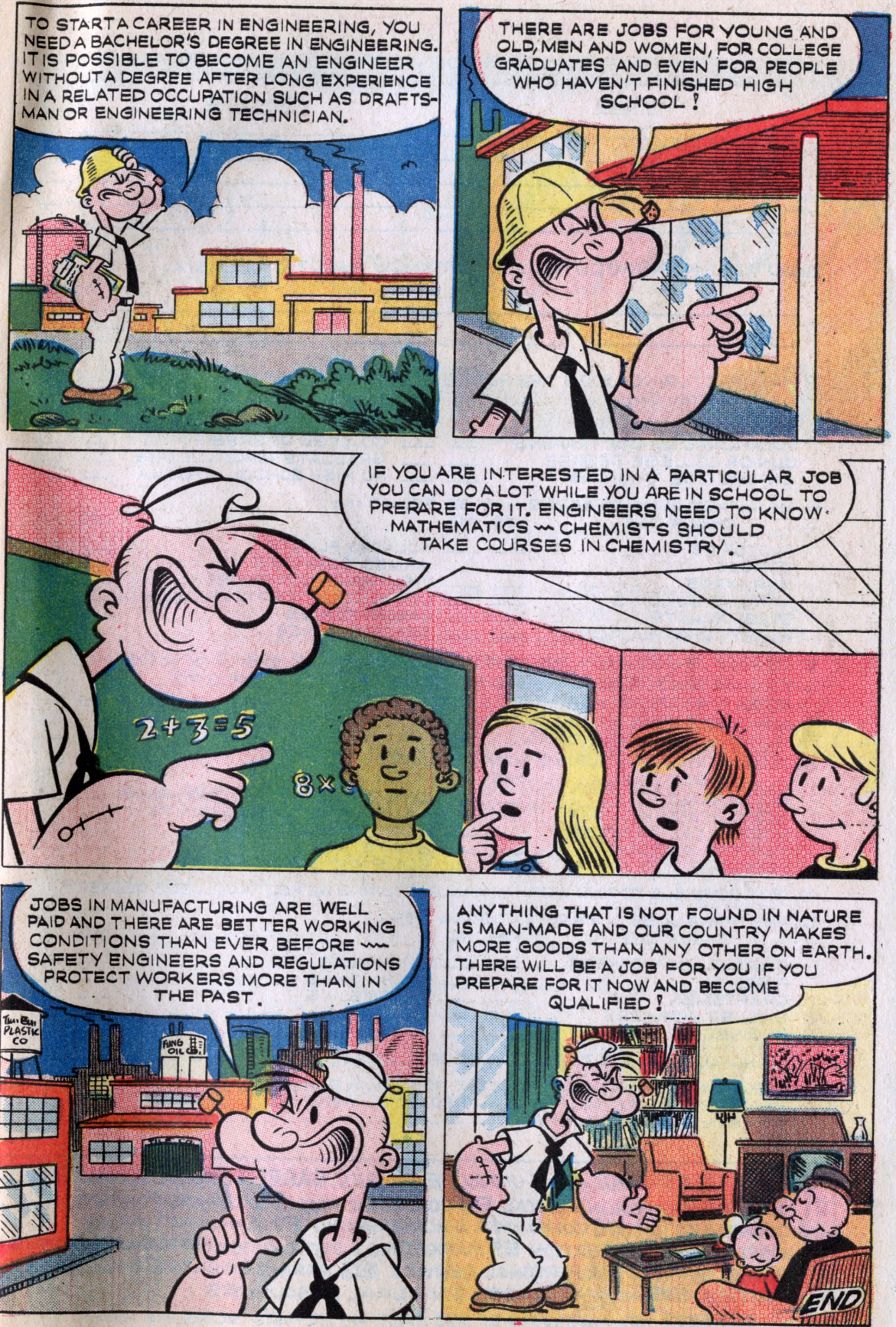

ENGINEERS DEVELOP METHODS FOR CHANGING RAW MATERIALS AND SOURCES OF POWER INTO USEFUL PRODUCTS AT A REASONABLE COST.


ENGINEERS DESIGN AND SUPERVISE THE CONSTRUCTION OF POWER DAMS.


ENGINEERS USE BASIC SCIENTIFIC PRINCIPLES TO ACHIEVE THEIR GOALS. THAT IS THE DIFFERENCE BETWEEN ENGINEERS AND SCIENTISTS.


THE CAPSULE MUST STAND TREMENDOUS HEAT, RADIATION AND EXTREME COLD. IT MUST ALSO MUST PROTECT THE LIFE OF THE CREW. AFTER MANY EXPERIMENTS THIS IS THE SIZE AND SHAPE BEST SUITED FOR THE FLIGHT TO THE MOON!


CIVIL ENGINEERS, WORKING FOR CITY GOVERNMENTS, SAFEGUARD THE PEOPLE AGAINST SEWER FAILURE, WATER SHORTAGES AND HELP MAINTAIN OTHER UTILITIES.
CITY ENGINEER'S OFFICE
MEN WORKING


TO START A CAREER IN ENGINEERING, YOU NEED A BACHELOR'S DEGREE IN ENGINEERING. IT IS POSSIBLE TO BECOME AN ENGINEER WITHOUT A DEGREE AFTER LONG EXPERIENCE IN A RELATED OCCUPATION SUCH AS DRAFTSMAN OR ENGINEERING TECHNICIAN.
THERE ARE JOBS FOR YOUNG AND OLD, MEN AND WOMEN, FOR COLLEGE GRADUATES AND EVEN FOR PEOPLE WHO HAVEN'T FINISHED HIGH SCHOOL!
IF YOU ARE INTERESTED IN A PARTICULAR JOB YOU CAN DO A LOT WHILE YOU ARE IN SCHOOL TO PRERARE FOR IT. ENGINEERS NEED TO KNOW MATHEMATICS ~ CHEMISTS SHOULD TAKE COURSES IN CHEMISTRY.
2+3=5
8×
JOBS IN MANUFACTURING ARE WELL PAID AND THERE ARE BETTER WORKING CONDITIONS THAN EVER BEFORE ~ SAFETY ENGINEERS AND REGULATIONS PROTECT WORKERS MORE THAN IN THE PAST.
PLASTIC CO
FUNG OIL
ANYTHING THAT IS NOT FOUND IN NATURE IS MAN-MADE AND OUR COUNTRY MAKES MORE GOODS THAN ANY OTHER ON EARTH. THERE WILL BE A JOB FOR YOU IF YOU PREPARE FOR IT NOW AND BECOME QUALIFIED!
END

CAN YOU ANSWER THESE ?

1. LIST FIVE MANUFACTURING JOBS YOU MIGHT ENJOY. NEXT TO EACH, LIST ANY TRAINING YOU WOULD NEED. YOU CAN FIND THE ANSWERS IN THIS BOOK.

JOBS	TRAINING

2. DID YOU FIND ANY JOB YOU DID NOT KNOW ABOUT ? LIST SIX.

3 MANUFACTURING JOBS ARE POSSIBLE WITH TRAINING WHICH MAY INCLUDE:

CHECK ONE	YES	NO		YES	NO
HIGH SCHOOL DIPLOMA			APPRENTICESHIP TRAINING		
VOCATIONAL SCHOOL TRAINING			COLLEGE DEGREE		
JUNIOR COLLEGE DEGREE			GRADUATE SCHOOL DEGREE		
ON-THE-JOB TRAINING			NO HIGH SCHOOL DIPLOMA		

4. MANUFACTURING CAREERS MAY BE FOUND IN:

CHECK ONE	YES	NO		YES	NO
FACTORIES			FOUNDRY PLANTS		
OFFICES			ARMED SERVICES		
SHIP YARDS			INSURANCE COMPANIES		
MACHINE BUILDING			LOCAL, COUNTY, STATE & FED. Agencies		
STEEL PLANTS			LABORATORIES		
HEAVY CONSTRUCTION			SPACE SCIENCE		

5. DO PEOPLE WORKING IN MANUFACTURING JOBS ALWAYS WORK DURING THE DAY ?

6. DO MANUFACTURING CAREERS SOMETIMES FORCE PEOPLE TO WORK IN EXTREME HEAT AND EXTREME COLD ?

7. ARE THERE JOBS IN MANUFACTURING FOR MEN AND WOMEN WITH A WIDE RANGE OF ABILITY AND TRAINING ?

8. JOBS IN MANUFACTURING MAY REQUIRE:

CHECK ONE	YES	NO		YES	NO
GOOD HEALTH			LIKE TO WORK WITH YOUR HANDS		
GOOD EYESIGHT			ABILITY TO READ BLUEPRINTS		
MECHANICAL APTITUDE			GOOD COORDINATION		
REPETITIVE WORK			BODY STRENGTH		
DEPENDABILITY			SOME MATHEMATICS SKILL		

9. IS IT POSSIBLE TO FIND WORK IN MANUFACTURING WITHOUT A COLLEGE DEGREE ?

10. ARE THERE JOBS IN MANUFACTURING FOR :

CHECK ONE	YES	NO		YES	NO
SEMISKILLED WORKERS			PHYSICISTS		
FOREMEN			TECHNICIANS		
CRAFTSMEN			ASSEMBLING		
SKILLED WORKERS			INSPECTION		
ENGINEERS			MACHINISTS		

11. MANUFACTURING IS THE LARGEST OF ALL MAJOR INDUSTRIES.

12. DOES POPEYE THINK IT IS IMPORTANT TO STAY IN SCHOOL AND PREPARE SO YOU WILL BE QUALIFIED IF YOU WANT TO WORK IN MANUFACTURING ?

OTHER TITLES AVAILABLE - KING FEATURES CAREER EDUCATIONAL SERIES

E1 HEALTH E2 ENVIRONMENTAL E3 COMMUNICATIONS E4 TRANSPORTATION E5 CONSTRUCTION E6 CONSUMER & HOMEMAKING E7 MANUFACTURING E8 HOSPITALITY & RECREATION E9 MARKETING & DISTRIBUTION E10 BUSINESS & OFFICE E11 PUBLIC SERVICE E12 PERSONAL SERVICE E13 MARINE SCIENCE E14 FINE ARTS & HUMANITIES E15 AGRI-BUSINESS & NATURAL RESOURCES

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ONE OF THE LARGEST CAREER FIELDS IN WHICH YOU CAN WORK IS IN MANUFACTURING.

ANYTHING THAT DOES NOT GROW OR IS NOT CREATED BY NATURE MUST BE MADE BY MAN. WHETHER THESE PRODUCTS ARE MADE BY HAND OR MACHINERY, BY ONE MAN OR MANY, THIS PROCESS IS CALLED MANUFACTURING. ALL KINDS OF JOBS, FROM COMPANY PRESIDENT, SALES MANAGER, PRODUCTION SUPERVISOR, CLERK, MACHINE TOOL OPERATOR AND HUNDREDS OF OTHER CAREERS ARE OPEN. THESE POSITIONS OFFER MANY REWARDS INCLUDING PRIDE IN WORK WELL DONE THAT BENEFITS MANY OTHER PEOPLE.

YOU MAY PREFER WORK IN THE OFFICE OF A FACTORY OR ACTUALLY PERFORMING SOME FUNCTION IN THE PRODUCTION OF AN APPLIANCE, FURNITURE OR FOOD. ANY JOB YOU DO IS IMPORTANT AND CAN BE VERY REWARDING. HOWEVER, YOU CAN EDUCATE YOURSELF AND ACQUIRE FURTHER TRAINING SO AS TO GET A DIFFERENT JOB WITH GREATER RESPONSIBILITIES AND REWARDS.

WHATEVER YOUR AGE, SEX, RACE OR RELIGION, THERE IS A JOB FOR YOU IN THIS FIELD IF YOU WANT ONE AND CAN QUALIFY. THERE ARE SPECIAL OPPORTUNITIES FOR THOSE WHO ARE MENTALLY OR PHYSICALLY HANDICAPPED.

INTERESTED? TALK WITH YOUR CAREER GUIDANCE COUNSELOR OR VOCATIONAL ADVISER IN SCHOOL. HE MAY HELP YOU TO VISIT AREAS IN WHICH THIS WORK IS PERFORMED.

Your Pal,
Popeye

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